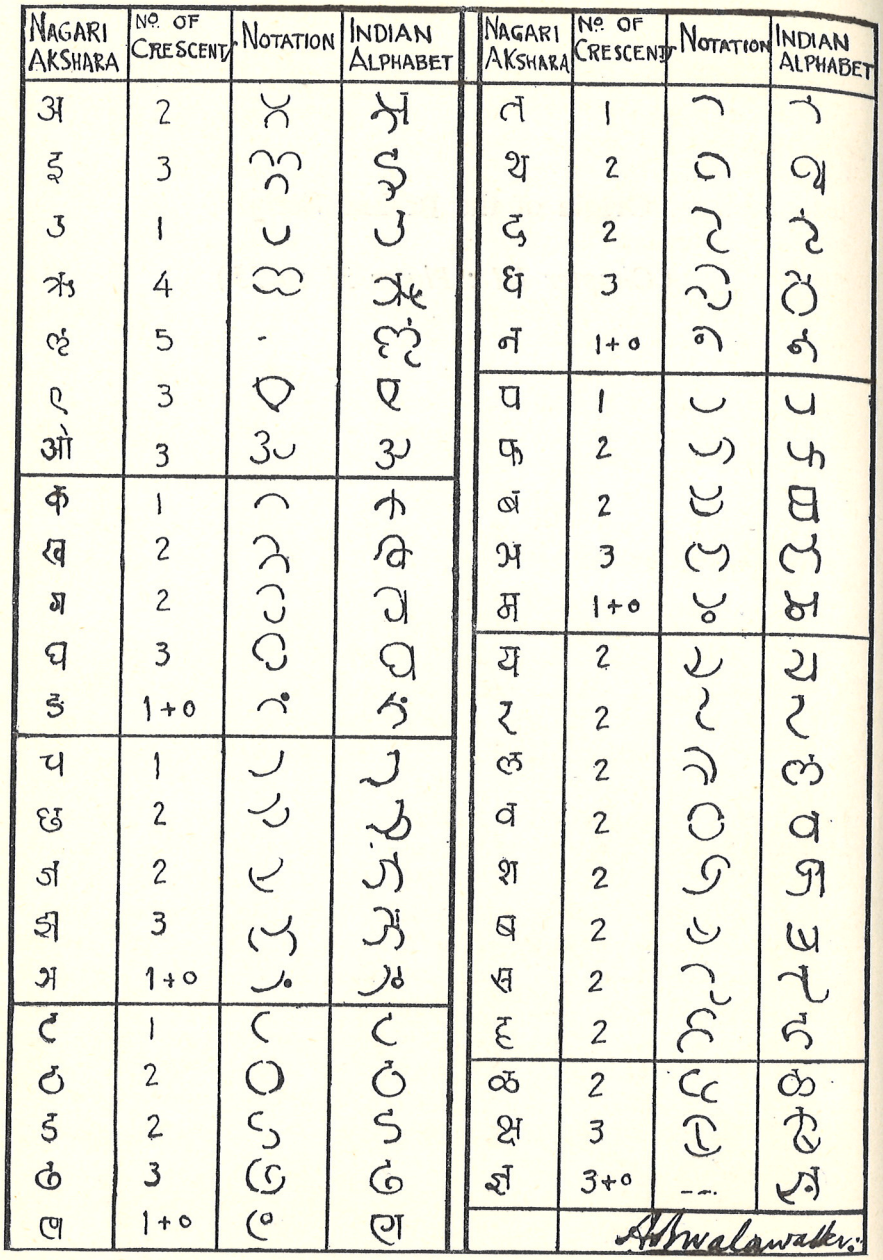


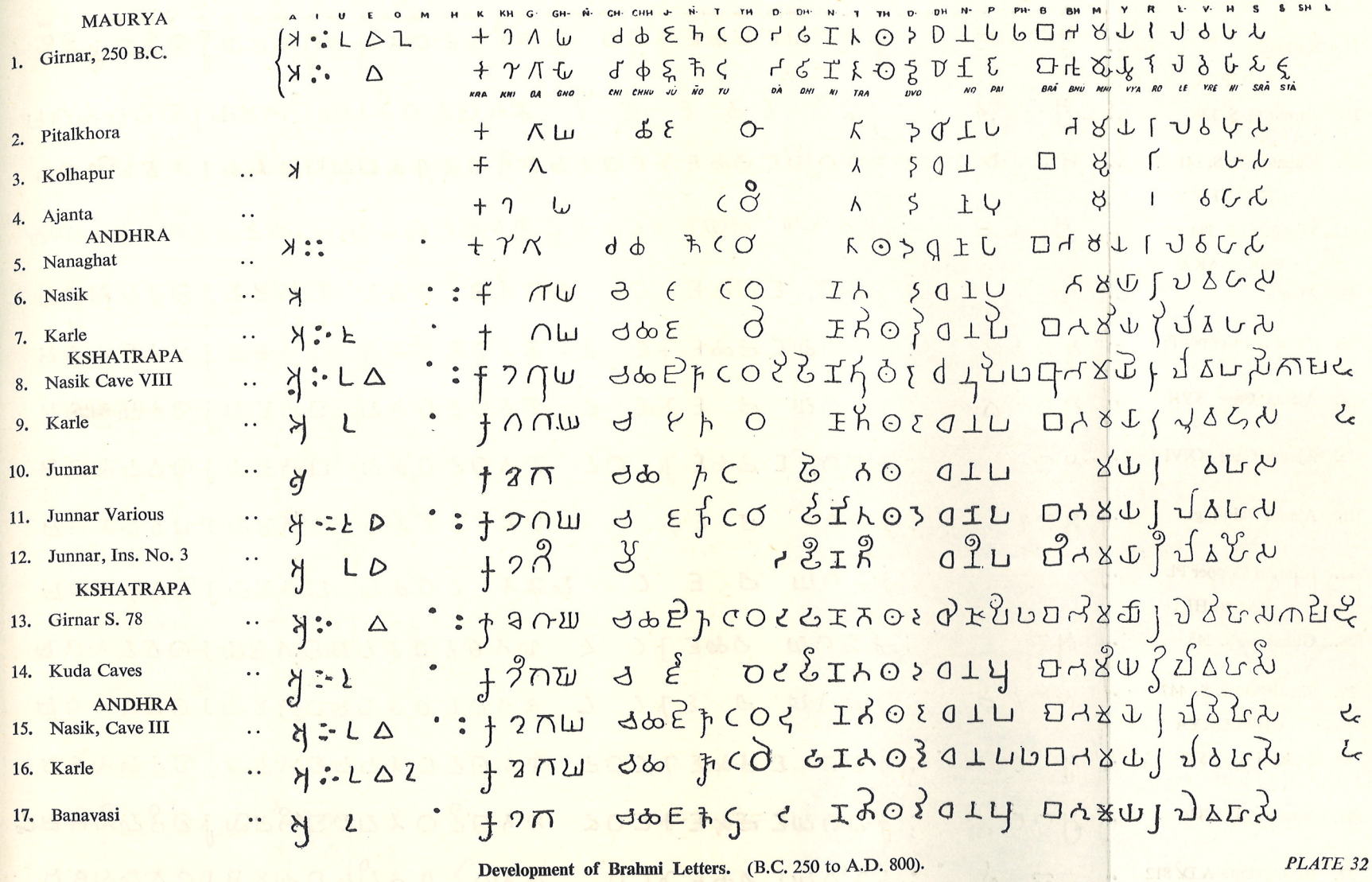
Nagari Akshara	No. of Crescent	Notation	Indian Alphabet
अ	2		
इ	3		
उ	1		
ऋ	4		
ऌ	5		
ए	3		
ओ	3		
क	1		
ख	2		
ग	2		
घ	3		
ङ	1+0		
च	1		
छ	2		
ज	2		
झ	3		
ञ	1+0		
ट	1		
ठ	2		
ड	2		
ढ	3		
ण	1+0		

Nagari Akshara	No. of Crescent	Notation	Indian Alphabet
त	1		
थ	2		
द	2		
ध	3		
न	1+0		
प	1		
फ	2		
ब	2		
भ	3		
म	1+0		
य	2		
र	2		
ल	2		
व	2		
श	2		
ष	2		
स	2		
ह	2		
क्ष	2		
क्ष	3		
ज्ञ	3+0	--	

A.V. Walawalkar.

Maheswari Technique of the Indian Alphabet

PLATE 31



Development of Brahmi Letters. (B.C. 250 to A.D. 800).

PLATE 32

18. Kadamba ..

GUPTA

19. Girnar G. S. 138 ..

20. Kuhaun, G. S. 141 ..

CHALUKYA

21. Vijayaraja S. 394 ..

VAKATAKA

22. Ajanta ..

23. Vakataka Copper Pl. ..

24. Ajanta Cave XVII ..

25. Ajanta Cave XXVI ..

26. Ajanta Paintings ..

27. Kanheri Copper Pl. ..

VALABHI

28. Guhasena S. 248 ..

29. Siladitya VI. S. 447 ..

CHALUKYA

30. Badami A.D. 578 ..

31. Aihole A.D. 634 ..

32. Rashtaakuta A.D. 812 ..

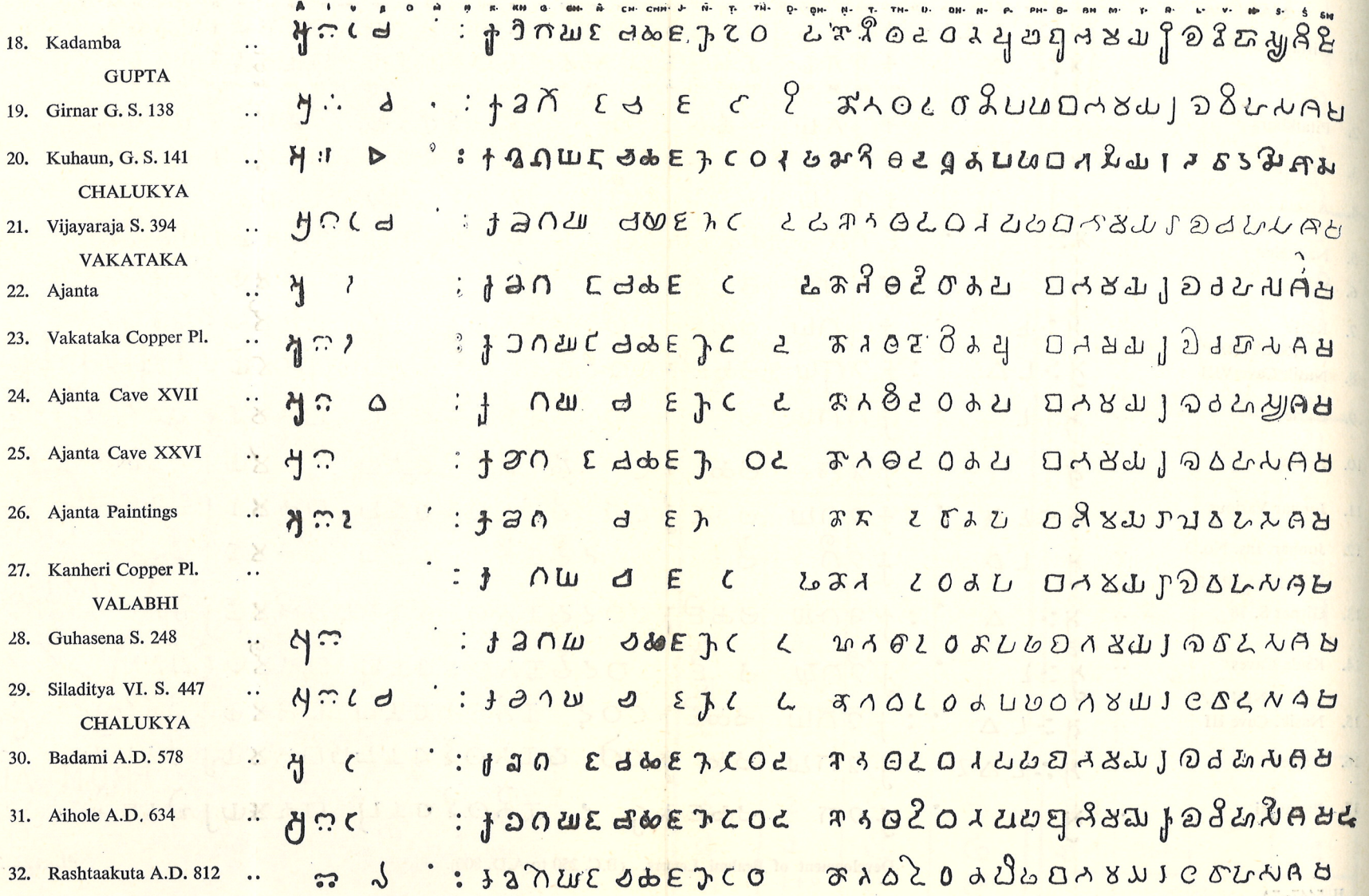
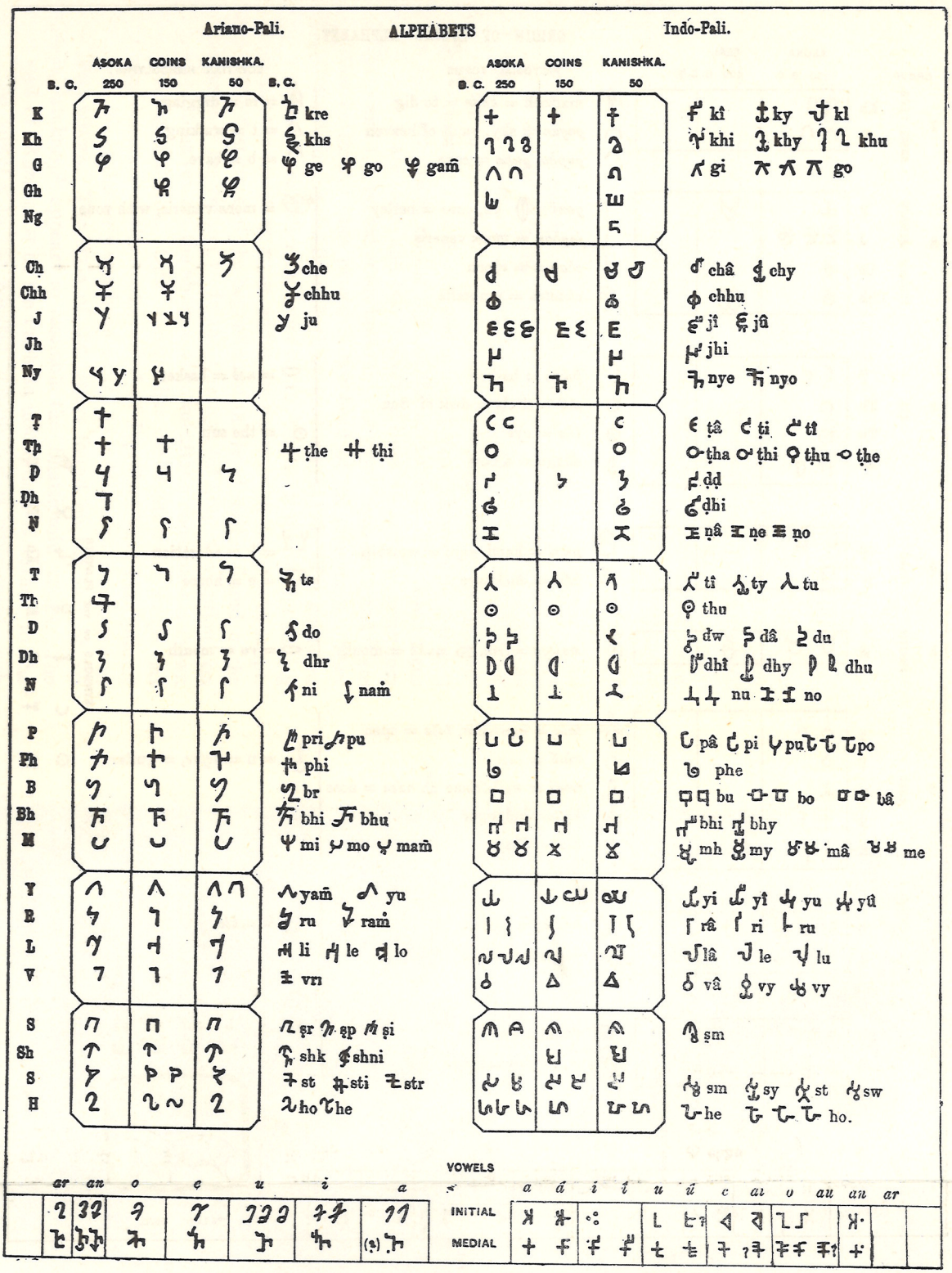


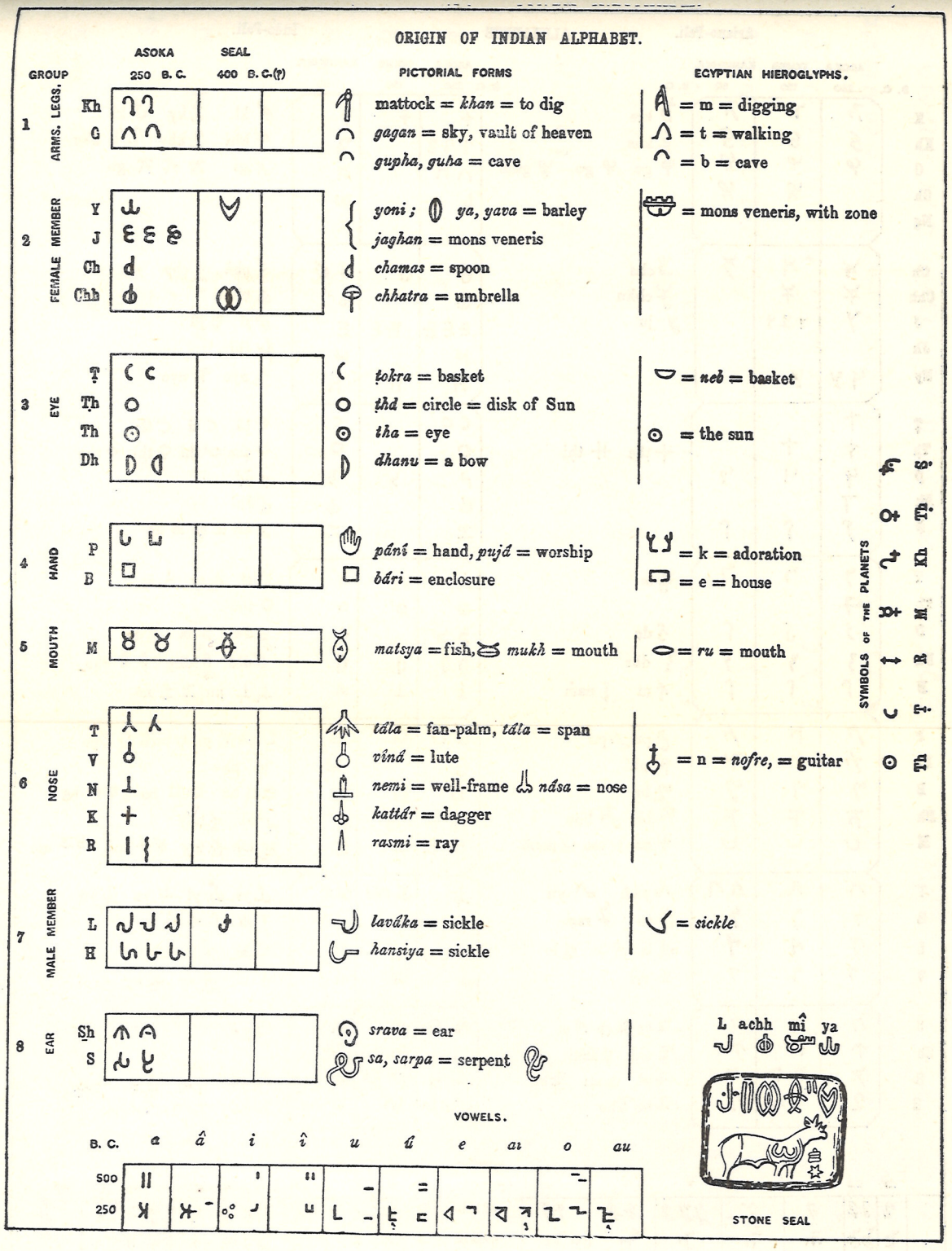
PLATE 33

Development of Brahmi Letters. (B.C. 250 to A.D. 800).



Courtesy Corpus Ins., Ind. Vol. I.

Comparative Table of Ariano Pali, and Indo-Pali Alphabets *PLATE 34*



Courtesy: Corpus Ins., Ind. Vol. I

Origin of Brahmi from Pictographs *PLATE 35*

CHAPTER IV

ORIGIN AND DEVELOPMENT OF INDIAN SCRIPTS

85. The Asoka-script is the oldest specimen of the Brahmi so far known. The very few specimens of earlier date so far discovered resemble the Brahmi writing of the Asoka Edicts. The Brahmi-script was invented and developed for writing when the writing material was scarce. Naturaly the principal aim in its development was economy of space. Various methods of constructing conjuncts by contracting consonant forms had, therefore, to be invented.

SOUTH ASOKA SCRIPT

86. The Girnar inscription[1] is representative of the South Asoka-script* The vowel sign for आ in the Asoka inscription is a horizontal line at the top right. Sometimes it is placed in the middle. The initial vowel इ is written in three dots. The medial vowel-sign for इ is however written as reversed L i.e. ⅃ The medial long ई sign has two vertical lines ।। These signs are placed on the right of the consonant. The vowel signs for उ and ऊ are one and two horizontal lines (– and =) sometimes vertical (। and ।।), placed at the bottom. The vowel signs for ए and ऐ are the same horizontal lines placed at the head of the consonant. They are also placed in the middle, in both the cases on the left. The *anuswāra* sign, a dot, is placed after the letter on the right. It may be interesting to note that the vowels ऋ, ॠ, ऌ and ॡ are not used in the Asoka-script.

87. The first trace of the beginning of the head serif is found in the Hāthigumpha[2] Inscription.† In the Bhattiprolu[3] Stūp Inscription‡ on the lids of stone vessels, the absence of vowel after a consonant is shown with a horizontal line. Ojha opines that the Bhattiprolu script has a source, common to the Aśoka-script[4] of Piprāhvā Vase Inscription.§ Probably this is the only specimen of the Dravidi script mentioned in the *Lalita-vistara*. The style of the letters found on the seal of Sri Yadnya Śatakarṇi[5] appears to resemble the Bhattiprolu script. The lower end of *Kānā* of अ in the Pabhosa inscription[6] is turned to the left.|| The vowel इ in the Kushan inscription[7] is represented with

*See Chap. II, Plate 28. †See Chap. II, Plate 23b. ‡See Chap. II, Plates 26 & 27.
§See Chap. I, Plate 2b. ||See Chap. II, Plate 24.

Table 6. **Evolution of Brahmi in North India (Devanagari) and South India (Kanarese).**

three horizontal lines. The graphemes of उ and ए are nearer the Nagari designs, while the consonants प, ल and ष resemble the Nagari letters.

Origin of Various Indian Scripts

88. It has been brought out by Dr. Burnell in his *South Indian Palaeography* that the current scripts of India have been developed from Brahmi and this has been elaborated in a chart prepared by L. S. Wakankar in the form of a tree.* Development of the present Indian scripts has been traced to the Northern and the Southern groups :

(*a*) Northern Group : (1) Gupta, (2) Kutila, (3) Nagari, (4) Sharada, (5) Bengali (Bangala).

(*b*) Southern Group : (1) Western (Gujarati—Modi), (2) Madhya Pradesh, (3) Telugu, Kannad, (4) Grantha, (5) Kalinga, (6) Vettelulu (Malayalam) and (7) Damila (Tamil).

89. Brahmi in use during the Gupta kingdom all over Northern India is recognised as Bharati or the Gupta script. The emergence of Nagari letters is seen in the Gupta inscriptions.[8] Gradual change in the vowel sign is also noticeable. Pabhosa Cave Inscription is in the Sunga type of Brahmi. The medieval and modern Indian characters arose from two prototypes—Sunga type and Kushana type. The design of letters in these types reveal that they were also written with pen or brush and ink. The Gupta Monumental type was used from middle of fourth century to the sixth century. Central Asian Slanting, a variety of Gupta script, is seen written in the MSS found in Central Asia. MSS are also found in Khotan written in the Central Asia Cursive Gupta. Bower MSS written in Sanskrit on birch bark in the Gupta character (fifth century A.D.) represent the Western Branch of Eastern Gupta.[9] The Tibetan script was modelled on Gupta character in the seventh century. In the Gupta script of the Allahabad Pillar Inscription, vowel इ is written with two dots and a vertical line; उ is written as Nagari ट and ए is in the form of a triangle. Designs of letters ड, ढ, त, द, प, भ, म and ष resemble the Nagari letters.

Scripts in Use in Medieval India

90. The Sidhamatṛka character developed from the Western Branch of the Eastern Gupta character in the sixth century A.D. Its design is angular and the vertical strokes are nail-headed. There are two types: Monumental and Cursive. The Sidhamatṛka character developed during

**See* Plate 36.

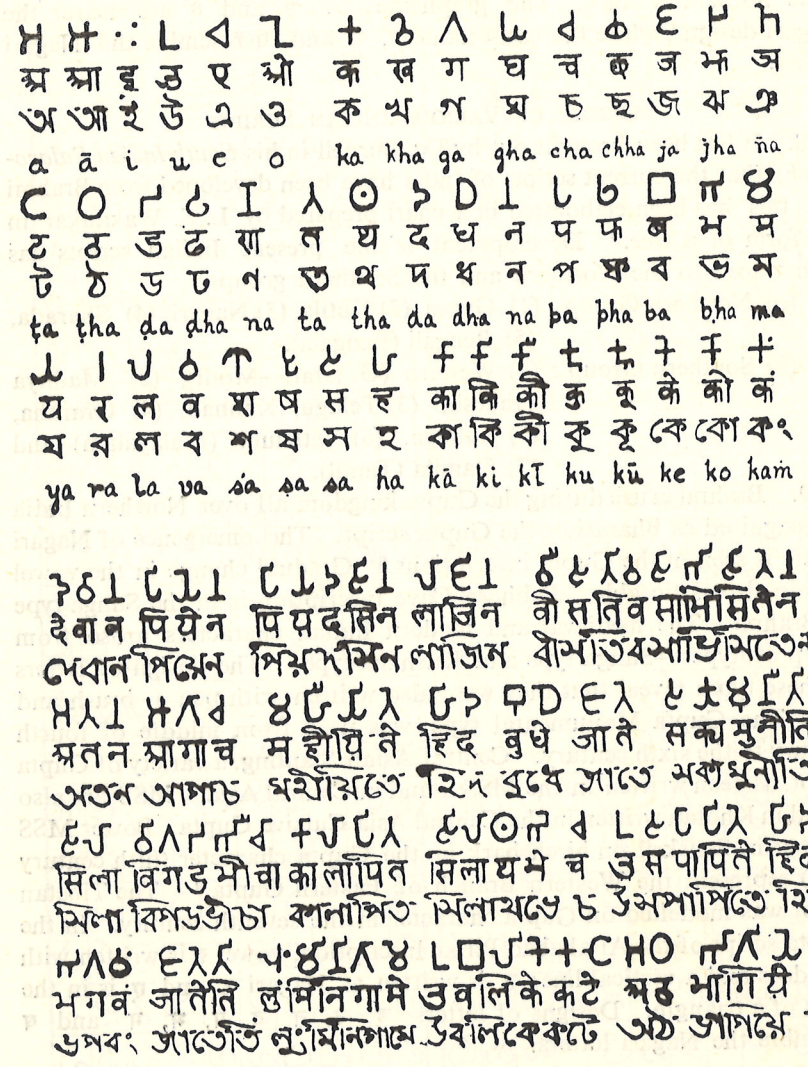
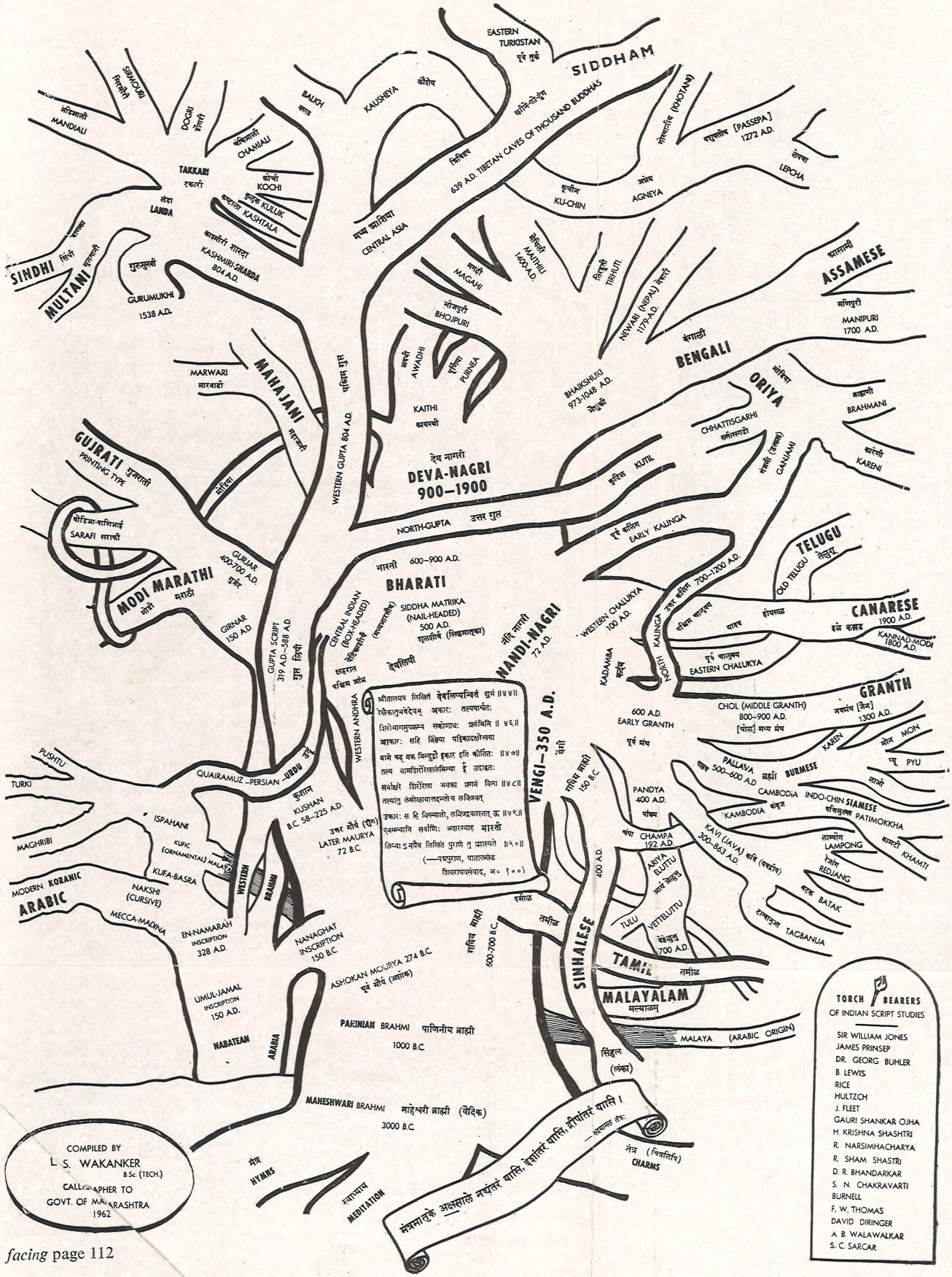

a ā i ī u ū e o ka kha ga gha cha chha ja jha ña
ṭa ṭha ḍa ḍha ṇa ta tha da dha na pa pha ba bha ma
ya ra la va śa ṣa sa ha kā ki kī ku kū ke ko kaṁ

Fig. 30. **Asokan Alphabet and Early forms of Brahmi, Devanagari and Bengali letters.**



facing page 112

Development of various Indian Scripts from Brahmi.

PLATE 36

the seventh century into the Kutila type,[10] which is the ancient form of Nagari and Sharada. Serifs in the Kutila inscription had taken a form of inverted triangles. The Nagari letters were gradually developing from eighth century. Distinct Nagari characters are first noticed in the North Indian Grant-deed of Mahendrapal (A.D. 955).[11] The earliest specimen of Nagari is however found in the South. It is a Grant-deed of the Rashtrakut king Dantidurg (A.D. 754),[12] found at Samangharh. Other specimen is the Paithan Grant-deed of Rashtrakut Govind (A.D. 794).[13] The South Indian form of Nagari, current since the eighth century, is known as Nandi-Nagari. The term Devanagari came to be used to distinguish the new script as late as the ninth century A.D. The nomenclature ' Devanagari ' is also translated as ' pertaining to the city of God ' which is said to be *Pātaliputra* or Patana of today.[14] Kakasaheb Kalelkar explains that *Vārānasi* was known as *Deva-nagari* (City of Gods) and hence the script, honoured in this *Vārānasi*, was called Devanagari. ' Nagari ' is mentioned in *Setu-Bandhan* of Bhaskaranand, as well as in *Vātulgāma.* Shamasastry connects the origin of the term Devanagari with *Devananam Nagaram* of the Tantirc worship.*

91. Sharada script used in the Kushana Inscriptions descended from Western Gupta characters in the ninth century. Sharada characters are given separate names. Specimen of Sharada script of Kutila descent is first seen in an inscription of King Meruvarma.[15] The Kashmiri and Takri scripts have descended from the Sharada script. Landha script employed in Punjab for writing Punjabi and its dialects, is a corrupt form of Sharada. The order of vowels differs from that in Devanagari and there is only one sibilant *sa.* Gurumukhi is the reformed version influenced by Devanagari. Gurumukhi letters also have distinct names.

92. The Proto-Bengali has developed from Nagari. The Western style of Gupta branched off from Sidhamaṭṛka in the seventh century. It was influenced by Nagari in the tenth century, developing into the Proto-Bengali script. The Bangarh grant of Mahipala I (A.D. 975-1026)[16] is an example of Proto-Bengali. The Early Nepali is also connected with Proto-Bengali. Current Bengali script appears to have developed from the Proto-Bengali as late as the seventeenth century. Oriya script also descended from Proto-Bengali and is influenced by the Telugu and Tamil styles of semi-circles. These rounded shapes are due to the structures of the palm-leaves used. Maithili characters used in Bihar, resembles Bengali, and also Modi to some extent. Manipuri and Assamese are other varieties of Bengali.

*See Chapter III, paragraph 59, p. 77.

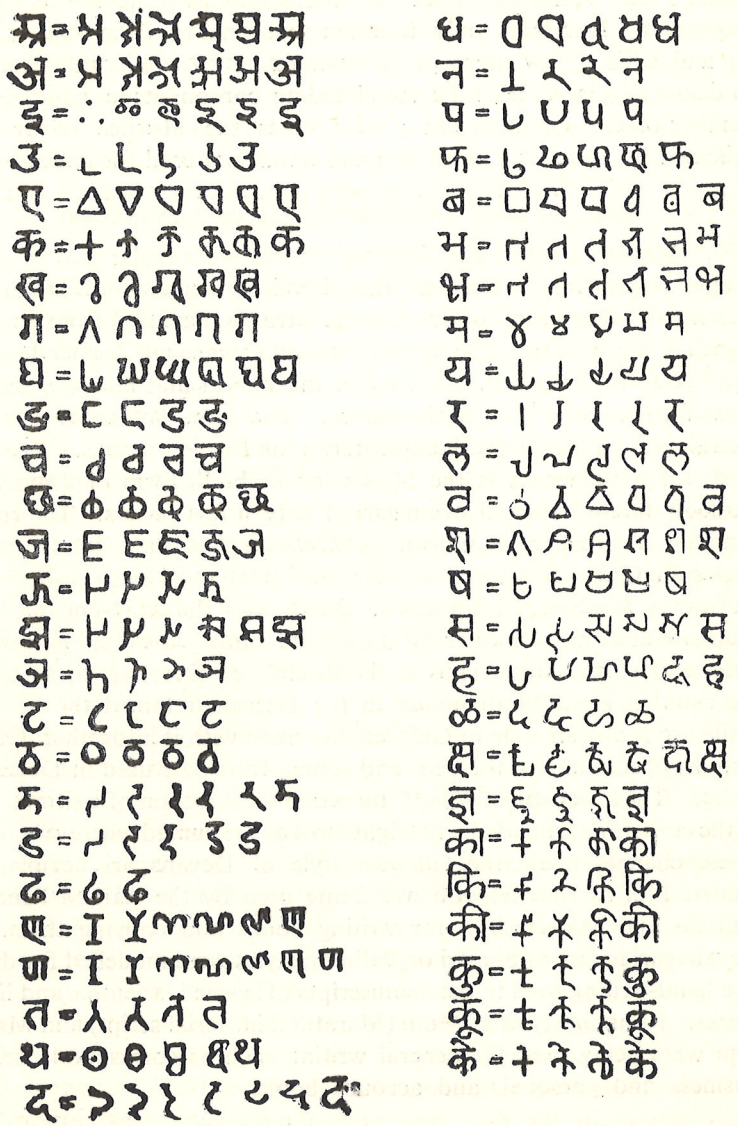
93. The Kaithi, official script of Bihar, is a descendent of the source common to Devanagari. Kaithi economises in strokes and also in letters. No distinction is made in long and short *i* and *u* vowels and *s* and ś consonants. Biharis also use Magadhi for the Magadhi language. Modern Gujarati script is a form of Devanagari influenced by the Kaithi style. Mahajani script used for the Marwari language is another variation. This is a corrupt hand of Devanagari frequently omitting vowel-signs. A variation of Mahajani is used for writing the Malavi language.

South Indian Scripts

94. The South Indian scripts, Tamil, Telugu, Malayalam and Kannad, have been developed from the original Brahmi signs, with some changes that are characteristic of the languages of Dravidian origin. The script of Bhattiprolu Vessels found in Krishna district of Madras is representative of Dravidi separated from Brahmi before 500 B.C. Southern style of Brahmi developed into (1) Western, (2) Central-Indian, (3) Telugu-Kannada, (4) Grantha, (5) Kalinga and (6) Tamil. Western style[17] was current during the period from fifth to the ninth centuries in Gujarat, Saurashtra, Nasik, Khandesh, Satara, part of Maharashtra and Konkan. A slightly different style known as Central Indian[18] was current in the Central Provinces. Telugu-Kannada style[19] was current in the Mysore area during the fifth century. It developed into Telugu-Kannad prototype from the eleventh to the fourteenth centuries and then branched off into Telugu and Kannada.

95. The Grantha character[20] was current in the Tamilnad during the fifth and the sixth centuries for writing Sanskrit. Owing to the deficiency of characters, Sanskrit cannot be written in the Tamil script. The variation of Brahmi used for writing books (*Grantha*) was thus called Grantha script. It developed into Middle Grantha and Transitional and culminated in Modern Grantha by the end of the thirteenth century. The Tulu-Malayalam is a variety of Middle Grantha that branched off in the eighth century. Vettelulu[21] is a variety of Tamil developed for speedy writing. It was current during the seventh to fifteenth centuries. Kalinga script is very old. The Hāthigumphā Inscription (150 B.C.) represents the Kalinga type of the Brahmi character. Indravarman Grant-deed represents later Kalinga style.[22] Kanarese characters appear in the fifth century in the Kadamba Inscriptions[23] and later Chalukya[24] in the sixth and the seventh centuries. The oldest literary work written in Kanarese belongs to the later half of the ninth century. Telugu characters are identical with Kanarese.

Table 7. **The Development of Devanagari Letters from Asokan Brahmi.**



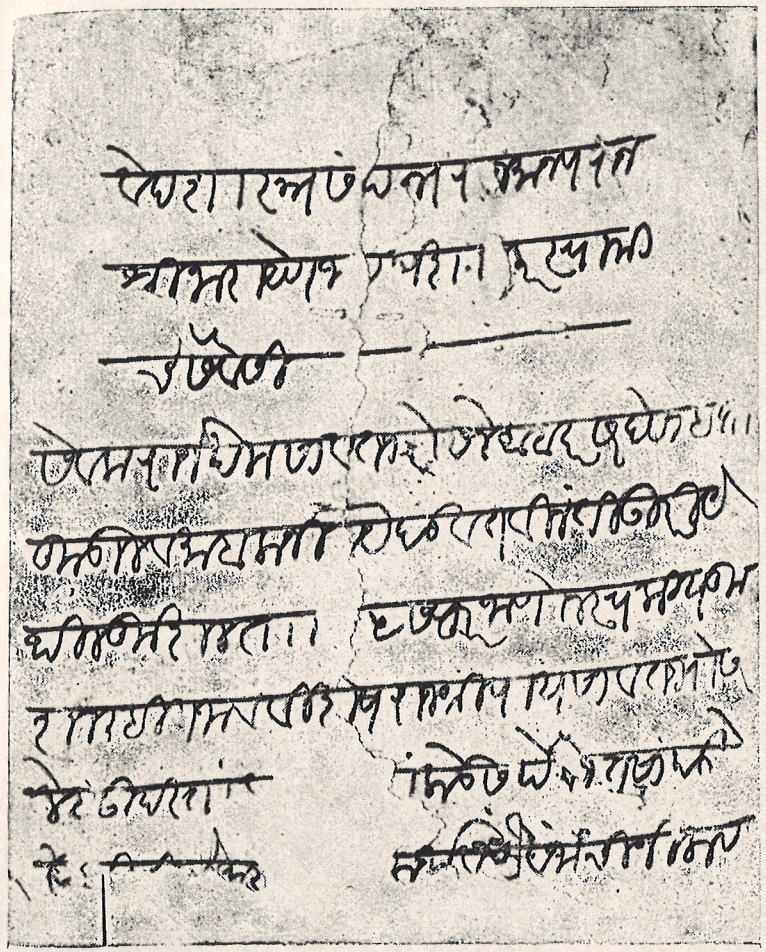
96. The Tamil script of today has developed[25] from the old Grantha to serve the Tamil language. It has economised in the consonant graphemes. It retains only fourteen consonants from the Sanskrit list and adds a few more of its own (ळ ऴ ऱ and ण्). Generally, no distinction is made in the vowel-ending consonants coming as first member of the conjunct. In a few cases the absence of vowel is indicated by a dot or a small line and nasals are used for *anuswāra*.

Balbodh and Gujarati Styles of Devanagari

97. Modern Bengali and Gujarati scripts are angular and of cursive designs respectively. They are the simplified versions of Devanagari, whereas all other scripts of South India have been evolved from an earlier branch of the Brahmi. The Western style of Devanagari further developed into two forms known as *Shastri Lipi* in Gujarat and *Balbodh*, meaning 'easy for the child', in Maharashtra. The term *Balbodhav* has been used in old Gujarati for commentaries on learned books. The script used for these works is the Shastri or Balbodh form of Devanagari. Balbodh differed from Devanagari in only a few letters. The running hand of Devanagari is known as *Mahajan Lipi* used in commercial circles in Gujarat, while a similar cursive style of Bharati-Brahmi is known as *Modi* in Maharashtra. Modi uses the head-line while the Gujarati does not. Earlier printing in Gujarati, however, is found to possess the head-line. Thus Balbodh style of Devanagari, as well as the running hand Modi in use in the Deccan, retained the head-line, while the Mahajan style in Gujarati dispensed with it altogether. Gujarati also dropped many of the pegs and some of the bars used in Devanagari script. The lower end of *Kānā* is turned in the direction of writing. Some of the corners are rounded. Straight strokes are curved wherever possible. These changes made the Gujarati style of Devanagari flexible. The Shastri Lipi or the Balbodh was being used by the learned Pandits in Gujarat and Maharashtra for writing books and copying them. The Devanagari letters of Shastri or Balbodh styles were modelled for decorative hand-writing used in the manuscripts of learned, scientific and literary works. Running styles of Modi (Marathi ministerial script) and Mahajan Lipi were being used for general writing such as correspondence, both business and personal, and account books.

Modi Script : Modern Version of Asoka Script

98. The Modi script is in use in Maharashtra for over four hundred years. Dr. Diringer has stated[26] that the Modi was invented by Balaji



Modi Hand-writing.

PLATE 37

Avaji in the seventeenth century. This is disproved as Modi documents dating 1597 A.D. have been published. Popular belief is that the script was brought to India from Ceylon by Hemadpant or Hemadri, the Minister to the court of Yadavas in the eleventh century. Chandorkar has dealt with the origin of Modi at length[27] in his book published in 1929. He stated that the present Devanagari script known as Balbodh in Maharashtra and Shastri in Gujarat, is the modern version of the ancient Devanagari, while the Modi script is the modern version of the script of the Asoka Edicts which is known as Pali. Chandorkar does not discard the convention that the Modi was brought from Ceylon by Hemadpant, and that it attained importance at the hands of the ministerial staff of Shivaji. He however asserts that the Modi is identical with Asoka-script or the *Maurya-lipi* referred to in the *Lalita-vistar* and popularly known as Pali. He justifies this theory on the basis of the internal evidence of similarity of forms, absence of certain vowels and consonant signs and the etymology : Script of the *Mauryas* (Mores)→Mouri, (Mori)→Modi. Taylor has referred to the term *Maurya* to mean the South Asoka alphabet "*Maurya* would be the best of all possible names for this alphabet".[28]

Comparison of Modi and Asoka Letters

99. Out of 36 letters in Devanagari 16 letters are common to the Balbodh and Modi* as shown hereunder :

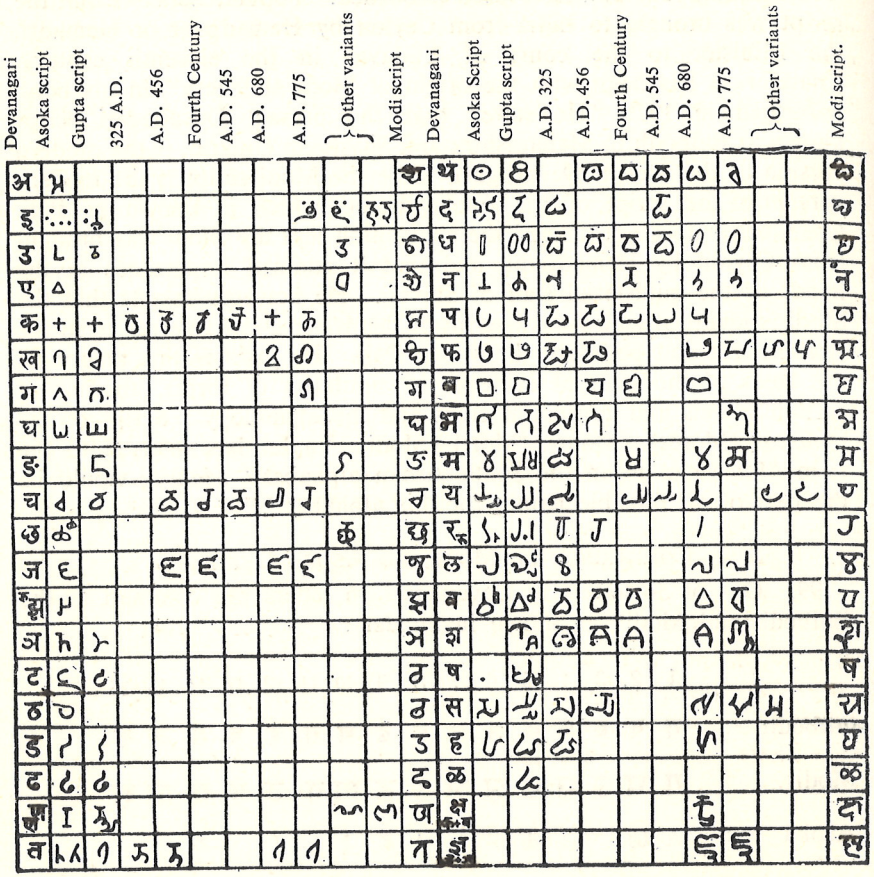
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Balbodh :	ग	घ	ङ	च	छ	झ	ञ	ड	ढ	ण	त	र	ष	स	ळ	क्ष
Modi :	𑘜	𑘝	𑘞	𑘟	𑘠	𑘡	𑘢	𑘣	𑘤	𑘥	𑘦	𑘧	𑘨	𑘩	𑘪	𑘫
Asoka :	∧	ω	⊀	⊕	⊬	h	⊀	⊂	I	⊬	∫					⊐

In case of 9 letters out of remaining 20, the Modi forms are common to the script of Asoka Edict, particularly the *Ākāras* of these letters resemble Modi forms :

	1	2	3	4	5	6	7	8	9
Balbodh :	क	फ	ट	ठ	न	भ	म	व	ह
Modi :	𑘎	𑘐	𑘑	𑘒	𑘓	𑘔	𑘕	𑘖	𑘗
Asoka :	+	७	८	⊃	⊥	⊓	⊻	⊙	⊎

*See Table 14, pp. 130-134 for Modi Alphabet and *Barakhadi*.

Table 8. **Comparative table of Devanagari, Asoka-Brahmi, Post Asoka-Brahmi and Modi letters.**



Seven Modi letters resemble the letters of the Asoka Edicts and the remaining four resemble the Balbodh :

	1	2	3	4	5	6	7	8	9	10	11
Balbodh :	ख	ज	थ	ब	य	श	ज्ञ	द	ध	प	ळ
Modi :	𑘒	𑘚	𑘜	𑘞	𑘟	𑘠	𑘡	𑘢	𑘣	𑘤	𑘪
Asoka :	ꠇ	ꠉ	ꠏ	ꠐ	ꠑ			ꠓ	ꠔ	ꠕ	

It will thus be seen that similarity of the Asoka script with Modi script is more pronounced than that with Balbodh.

Balbodh and Modi

100. One of the distinctive features of the dissimilar letters in Balbodh and Modi is that the strokes in Balbodh are drawn from top to bottom, while those in Modi are drawn from bottom to top. For instance :

Balbodh : क ख च ज ट ठ थ द ध न प फ ब भ म य र ल व स ह

Modi : 𑘎 𑘒 𑘙 𑘚 𑘛 𑘜 𑘝 𑘞 𑘟 𑘠 𑘣 𑘤 𑘥 𑘦 𑘧 𑘨 𑘩 𑘪

(1) The Modi letters are syllables as they cannot be drawn without the inherent vowel sign *Kānā*.

(2) Close examination of the dissimilar forms in the Balbodh and Modi show that the Modi is not derived from Balbodh :

Balbodh : आ ई ख ज ट थ प ब य श स ह ज्ञ कु खु गु

Modi : 𑘀 𑘁 𑘒 𑘚 𑘛 𑘜 𑘤 𑘞 𑘟 𑘠 𑘡 𑘢 𑘣 𑘀𑘵 𑘁𑘵 𑘎𑘵

(3) It is argued that the Modi is the outcome of the speedy writing of Balbodh without lifting the pen. The Modi forms of ग ङ झ ज ष and क्ष do not support this view.

(4) The Modi forms of क and फ are very dissimilar to Balbodh, particularly the strokes on the right-hand side.

(5) The precision of long and short vowels, observed in Balbodh, is neglected in the Modi writing.

(6) Modi has no graphemes for ऋ, the phonemes ॡ, ॠ etc. cannot be correctly represented in Modi.

(7) There are no separate signs for ए ऐ in Modi. They are represented by the graphemes of अ with a *Mātrā*.

Asoka-lipi and Modi

101. (1) There is no provision in Modi to represent vowel-less letter *i.e.* only consonant. This peculiarity is common to the Asoka-lipi.

(2) Although the long and short vowels can be represented in Modi, the distinction is absent as is the case with the Asoka-lipi.

(3) The vowels ऋ, ॠ and ऐ cannot be represented in Modi as is the case with the Asoka-lipi.

(4) The method of joining the vowel signs to the consonants is common to both the Asoka-lipi and Modi. In the Asoka-lipi as well as in Modi the sign of vowel आ is seen in the middle in letters का, खा, जा, मा etc. The vowel, long ई, is indicated by doubling the sign of short इ, in both the Asoka-lipi and Modi. In Modi the sign of vowel उ is (*i*) placed at the bottom as in Devanagari, (*ii*) placed in the same line after the consonant,

(*iii*) indicated by a horizontal line on the left or (*iv*) the उ ending letter takes a different form as in कु, खु etc. In method (*iii*), the similarity between the Asoka-lipi and Modi is noticed while the method (*iv*) is very peculiar to the Asoka-lipi. The letters कू and खू in Modi are written with the short उ sign doubled. The letter ज्ञ in Modi is constructed by placing न after ज which is in the Asoka style.

102. Chandorkar has suggested that the distinction in the Devanagari and the Asoka-lipi is based on the requirements of Sanskrit and Prakrit respectively. Prakrit grammar of Hemachandra states that the vowel is always present in the consonant.[29] The same authority states that the vowels ऋ, ॠ, ऌ, ॡ, ऐ, औ and the consonants ङ, ञ, श, ष are not used in *Prakrit*. Modi does not use ऋ, ॠ while the Asoka-lipi does not make use of ऐ.[30] There is no rigidity in regard to long and short vowels in Prakrit. The Asoka-lipi and Modi possess the signs for short and long vowels but do not use them with precision.[31]

Eclipse of Modi Script by Devanagari

103. Dr. Bhagwat deals with the attributes of the Modi script in his recent study of the speed script : " In a running script a word is written from start to finish without a break in between its component letters. Though Modi is not in that sense a running script it has succeeded to a remarkable degree in getting over the tedium of Balbodh writing. It makes use of a number of devices many of which, though not logically sound, have added to its capability for fluency. Provision of multi-allographs for a single phoneme, a left detour over the head-line to reach a front letter, unavoidable retention of letter-bars, ambiguity about writing-direction and arbitrary placements of conjunctal parts are some of the characteristics of Modi which, though they have made it about forty-five per cent faster than Balbodh, have rendered it difficult for learning and reading, not to speak of its incapacity for facile printing. Again, it could not clear all the pegs, daggers and multi-sloped diacritics from the Balbodh deck. In spite of these shortcomings, *Modi replaced Balbodh and flourished for nearly four centuries*. The reason was clear. Modi seemed to run on the Marathi track whereas Balbodh could just walk. So long as it was the question of hand-writing alone, Modi proved very effective and stood the ground well. With the advent of printing and its speedy development in Maharashtra, however, the assured place of Modi was challenged. Modi was essentially a hand-script. *It could not be easily taken on the printer's lines and that was the end of its unquestioned supremacy over Balbodh.*"[32]

Modern Indian Scripts

104. The Eighth Schedule of the Constitution of India specifies fourteen languages. The Urdu language uses a script derived from Persian. Remaining thirteen languages use different scripts derived from Brahmi of the Northern and the Southern styles. The number of speakers of these languages specified in Schedule VIII of the Indian Constitution, is given below :

Table 9. **Language and Population tables**[33]

Group		*Script*	*Language*	*Population*
(*a*) Northern Brahmi	1.	Devanagari	Sanskrit	2,544
	2.	,,	Marathi	3,32,86,771
	3.	,,	Hindi	13,34,35,360
		Total—Devanagari Script ..		*16,67,24,675*
	4.	Gujarati	Gujarati	2,03,04,464
	5.	Bengali	Bengali	3,38,88,939
	6.	Assamese	Assamese	68,03,465
	7.	Uriya	Uriya	1,57,19,398
	8.	Kashmiri	Kashmiri	19,56,115
	9.	Gurumukhi	Punjabi	1,09,50,826
		Total—Other Northern Scripts ..		*8,96,23,207*
(*b*) Southern Brahmi	10.	Kannada	Kannad	1,74,15,827
	11.	Telugu	Telugu	3,76,68,132
	12.	Malayalam	Malayalam	1,70,15,782
	13.	Tamil	Tamil	3,05,62,706
		Total—Southern Scripts ..		*10,26,62,447*
(*c*) Persian Origin	14.	Urdu	Hindustani	2,33,23,518
(*d*) Other		*Total—Other Languages* ..		*5,01,28,776*
		Grand Total ..		*43,24,62,623*

105. In addition to the fourteen languages, seventeen more languages not included in the Eighth Schedule, having a strength of 5,00,000 and over are enumerated in the Census. These languages spoken by over 50 million Indians are listed below :

Table 10. **Minor Languages and Populations.**

Bihari	..	1,68,06,772	Kumauni	..	10,30,254
Rajasthani	..	1,49,33,016	Nepali	..	10,21,102
Santali	..	32,47,058	Pahari (Unspecified)	..	10,04,371
Bhili	..	24,39,611	Tulu	..	9,35,108
Gondi	..	15,01,431	Garhwali	..	8,09,967
Sindhi	..	13,71,932	Mundari	..	7,37,037
Konkani	..	13,52,363	Ho	..	6,48,359
Kurukh/Oraon	..	11,41,804	Manipuri/Meitheli	..	6,36.430
			Kui	..	5,12,161

Note.—The graphemes in thirteen Indian scripts are tabulated in tables 11 and 12 at pages 123 to 126 in the Table of Transliteration, for easy reference.

106. Thus 166·7 million, i.e. about 38·55 per cent of the population in India speak three languages which use the Devanagari script. Out of fourteen languages recognised as the National Languages, six languages, i.e. Gujarati, Bengali, Assamese, Oriya, Kashmiri and Punjabi spoken by about 89.6 million (20·72 per cent), can easily adopt the Devanagari script. The Bihari and Rajasthani spoken by 31·7 million (7·22 per cent) can also be written in the Devanagari script. Hindi, one of the three languages written in Devanagari, has been given the status of the Official Language of the Indian Union and will in course of time replace English, when it will be used at the Centre and by the States for all the inter-State communication. Many of the newspapers and books which are now printed in English will then be printed in Hindi and other regional languages. *The Devanagari script will thus gain great importance in the near future.*

ANNEXURE C

MODERN INDIAN SCRIPTS AND MODI

(*Tables 11 to 19*)

Table 11. **Table of Transliteration : Indian Languages.**

	Assamese	Bengali	Gujarati	Hindi	Kannada	Malayalam	Marathi	Oriya	Punjabi	Sanskrit	Tamil	Telugu	Roman
a	অ	অ	અ	अ	ಅ	അ	अ	ଅ	ਅ	अ	அ	అ	a
ā	আ	আ	આ	आ	ಆ	ആ	आ	ଆ	ਆ	आ	ஆ	ఆ	ā
i	ই	ই	ઇ	इ	ಇ	ഇ	इ	ଇ	ਇ	इ	இ	ఇ	i
ī	ঈ	ঈ	ઈ	ई	ಈ	ഈ	ई	ଈ	ਈ	ई	ஈ	ఈ	ī
u	উ	উ	ઉ	उ	ಉ	ഉ	उ	ଉ	ਉ	उ	உ	ఉ	u
ū	ঊ	ঊ	ઊ	ऊ	ಊ	ഊ	ऊ	ଊ	ਊ	ऊ	ஊ	ఊ	ū
ṛ	ঋ	ঋ	ઋ	ऋ	ಋ	ഋ	ऋ	ଋ		ऋ		ఋ	ṛ
e	এ	এ	એ	ए	ಎ	എ	ए	ଏ		ए	எ	ఎ	e
ē					ಏ	ഏ			ਏ		ஏ	ఏ	ē
ai	ঐ	ঐ	ઐ	ऐ	ಐ	ഐ	ऐ	ଐ	ਐ	ऐ	ஐ	ఐ	ai
o	ও	ও	ઓ	ओ	ಒ	ഒ	ओ	ଓ		ओ	ஒ	ఒ	o
ō					ಓ	ഓ			ਓ		ஓ	ఓ	ō
au	ঔ	ঔ	ઔ	औ	ಔ	ഔ	औ	ଔ	ਔ	औ	ஔ	ఔ	au
ka	ক	ক	ક	क	ಕ	ക	क	କ	ਕ	क	க	క	ka
kha	খ	খ	ખ	ख	ಖ	ഖ	ख	ଖ	ਖ	ख		ఖ	kha
ga	গ	গ	ગ	ग	ಗ	ഗ	ग	ଗ	ਗ	ग		గ	ga
gha	ঘ	ঘ	ઘ	घ	ಘ	ഘ	घ	ଘ	ਘ	घ		ఘ	gha
ṅa	ঙ	ঙ	ઙ	ङ	ಙ	ങ	ङ	ଙ	ਙ	ङ	ங	ఙ	ṅa

Note.—The Table of Transliteration is reproduced here with the kind permission of the Curator of the National Library, Calcutta.

	Assamese	Bengali	Gujarati	Hindi	Kannada	Malayalam	Marathi	Oriya	Punjabi	Sanskrit	Tamil	Telugu	Roman
ca	চ	চ	ચ	च	ಚ	ച	च	ଚ	ਚ	च	ச	చ	ca
cha	ছ	ছ	છ	छ	ಛ	ഛ	छ	ଛ	ਛ	छ		ఛ	cha
ja	জ	জ	જ	ज	ಜ	ജ	ज	ଜ	ਜ	ज	ஜ	జ	ja
ja				ज़					ਜ਼				ja
jha	ঝ	ঝ	ઝ	झ	ಝ	ഝ	झ	ଝ	ਝ	झ		ఝ	jha
ña	ঞ	ঞ	ઞ	ञ	ಞ	ഞ	ञ	ଞ	ਞ	ञ	ஞ	ఞ	ña
ṭa	ট	ট	ટ	ट	ಟ	ട	ट	ଟ	ਟ	ट	ட	ట	ṭa
ṭha	ঠ	ঠ	ઠ	ठ	ಠ	ഠ	ठ	ଠ	ਠ	ठ		ఠ	ṭha
ḍa	ড,ড়	ড,ড়	ડ	ड,ड़	ಡ	ഡ	ड	ଡ	ਡ,ੜ	ड		డ	ḍa
ḍha	ঢ,ঢ়	ঢ,ঢ়	ઢ	ढ,ढ़	ಢ	ഢ	ढ	ଢ	ਢ	ढ		ఢ	ḍha
ṇa	ণ	ণ	ણ	ण	ಣ	ണ	ण	ଣ	ਣ	ण	ண	ణ	ṇa
ta	ত	ত	ત	त	ತ	ത	त	ତ	ਤ	त	த	త	ta
tha	থ	থ	થ	थ	ಥ	ഥ	थ	ଥ	ਥ	थ		థ	tha
da	দ	দ	દ	द	ದ	ദ	द	ଦ	ਦ	द		ద	da
dha	ধ	ধ	ધ	ध	ಧ	ധ	ध	ଧ	ਧ	ध		ధ	dha
na	ন	ন	ન	न	ನ	ന	न	ନ	ਨ	न	ந,ன	న	na
pa	প	প	પ	प	ಪ	പ	प	ପ	ਪ	प	ப	ప	pa
pha	ফ	ফ	ફ	फ	ಫ	ഫ	फ	ଫ	ਫ	फ		ఫ	pha
ba	ব	ব	બ	ब	ಬ	ബ	ब	ବ	ਬ	ब		బ	ba
bha	ভ	ভ	ભ	भ	ಭ	ഭ	भ	ଭ	ਭ	भ		భ	bha
ma	ম	ম	મ	म	ಮ	മ	म	ମ	ਮ	म	ம	మ	ma

	Assamese	Bengali	Gujarati	Hindi	Kannada	Malayalam	Marathi	Oriya	Punjabi	Sanskrit	Tamil	Telugu	Roman
ya	য	য	ય	य	ಯ	യ	य	ଯ	ਯ	य	ய	య	ya
ra	ৰ	র	ર	र	ರ	ര,റ	र	ର	ਰ	र	ர,ற	ర	ra
la	ল	ল	લ	ल	ಲ	ല,ഴ	ल	ଲ	ਲ	ल	ல,ழ	ల	la
va	ৱ	ব	વ	व	ವ	വ	व	ଵ	ਵ	व	வ	వ	va
śa	শ	শ	શ	श	ಶ	ശ	श	ଶ	ਸ਼	श		శ	śa
ṣa	ষ	ষ	ષ	ष	ಷ	ഷ	ष	ଷ		ष	ஷ	ష	ṣa
sa	স	স	સ	स	ಸ	സ	स	ସ	ਸ	स	ஸ	స	sa
ha	হ	হ	હ	ह	ಹ	ഹ	ह	ହ	ਹ	ह	ஹ	హ	ha
ḷa			ળ		ೞ	ള	ळ	ଳ		ळ	ள	ళ	ḷa
tta						�tt							tta
rra											ற்ற		rra
ṁ	ং	ং	ં	ं	ಂ			ଂ		ं		ం	ṁ
ṁ	ঁ	ঁ		ँ			ँ	ଁ	ੰ				ṁ
ḥ	ঃ	ঃ	ઃ	ः	ಃ		ः	ଃ		ः	ஃ	ః	ḥ
ṅ ñ ṇ n m									◦				ṅ ñ ṇ n m

Table 12. **Transliteration of Urdu.**

ا = a	ب = b	پ = p	ت = t	ٹ = ṭ	ث = th	ج = j
چ = ch	ح = ḥ	خ = kh	د = d	ڈ = ḍ	ذ = dh	ر = r
ڑ = ṛ	ز = z	ژ = zh	س = s	ش = sh	ص = ṣ	ض = ḍ
ط = ṭ	ظ = ẓ	ع = ʿ	غ = gh	ف = f	ق = q	ک = k
گ = g	ل = l	م = m	ن = n	ں = ṇ	و = w	ہ = h
ھ = h	ء = ʾ	ی = i	ے = y			

ـَ = a	ـِ = i	ـُ = u	آ = ā
ی = ī	ـُو = ū	ـَی = ay	ـَو = aw

Devanagari	Grantha	Kaithi	Maithili	Tulu	Sarada	Takari	Gurumukhi
अ	𑌅	𑂃	𑒁	𑎡	𑆃	𑚀	ਅ
अ			𑒂				
अ			𑒃				
आ	𑌆	𑂄	𑒄	𑎢	𑆄	𑚁	ਆ
आ			𑒅				
इ	𑌇	𑂅	𑒆	𑎣	𑆅	𑚂	ਇ
ई	𑌈	𑂆	𑒇	𑎤	𑆆	𑚃	ਈ
उ	𑌉	𑂇	𑒈	𑎥	𑆇	𑚄	ਉ
ऊ	𑌊	𑂈	𑒉	𑎦	𑆈	𑚅	ਊ
ऋ	𑌋		𑒋	𑎧	𑆉		਋
ॠ	𑌌		𑒌	𑎨	𑆊		
ऌ	𑌍		𑒍	𑎩	𑆋		
ॡ	𑌎		𑒎	𑎪			
ए	𑌏	𑂉	𑒏	𑎫	𑆌	𑚇	ਏ
ऐ	𑌐	𑂊	𑒐	𑎬	𑆍	𑚈	ਐ
ओ	𑌓	𑂋	𑒑	𑎭	𑆎	𑚉	ਓ
औ	𑌔	𑂌	𑒒	𑎮	𑆏	𑚊	ਔ
अं	𑌂	𑂍	𑒓		𑆐	𑚋	ਅਂ
अः		𑂎	𑒔		𑆑		ਅਃ
क	𑌕	𑂐	𑒖	𑎯	𑆒	𑚍	ਕ
ख	𑌖	𑂑	𑒗	𑎰	𑆓	𑚎	ਖ
ग	𑌗	𑂒	𑒘	𑎱	𑆔	𑚏	ਗ
घ	𑌘	𑂓	𑒙	𑎲	𑆕	𑚐	ਘ
ङ	𑌙		𑒚	𑎳	𑆖	𑚑	ਙ
च	𑌚	𑂔	𑒛	𑎴	𑆗	𑚒	ਚ
छ	𑌛	𑂕	𑒜	𑎵	𑆘	𑚓	ਛ
ज	𑌜	𑂖	𑒝	𑎶	𑆙	𑚔	ਜ
झ	𑌝	𑂗	𑒞	𑎷	𑆚	𑚕	ਝ
ञ	𑌞		𑒟	𑎸	𑆛	𑚖	ਞ

Table 13. **Table of Transliteration : Other Indian Scripts**

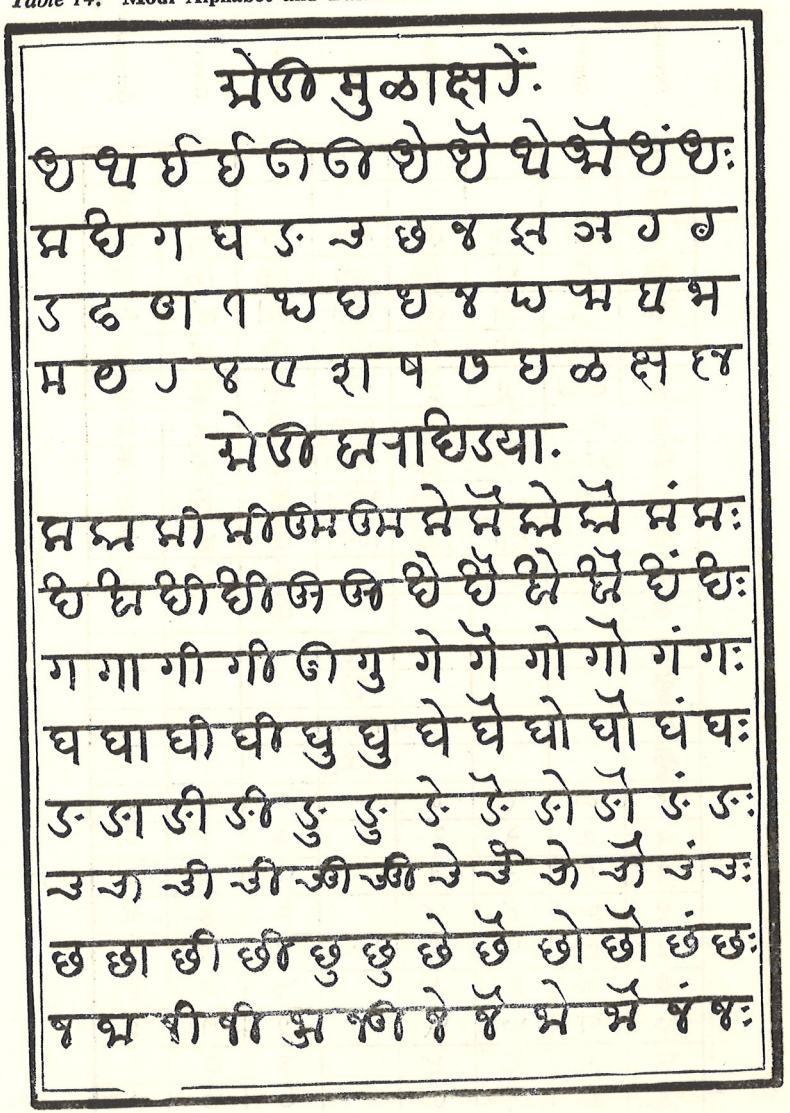
Devanagari	Grantha	Kaithi	Maithili	Tulu	Sarada	Takari	Gurumukhi
ट	ട	ट	ट	ಟ	ಟ	ट	ਟ
ठ	ഠ	ठ	ठ	ಠ	ಠ	ठ	ਠ
ड	ഡ	ड	ड	ಡ	ಡ	ड	ਡ
ढ	ഢ	ढ	ढ	ಢ	ಢ	ढ	ਢ
ण	ണ	ण	ण	ಣ	ಣ	ण	ਣ
ण़			ण़				
त	ത	त	त	ತ	ತ	त	ਤ
थ	ഥ	थ	थ	ಥ	ಥ	थ	ਥ
द	ദ	द	द	ದ	ದ	द	ਦ
ध	ധ	ध	ध	ಧ	ಧ	ध	ਧ
न	ന	न	न	ನ	ನ	न	ਨ
प	പ	प	प	ಪ	ಪ	प	ਪ
फ	ഫ	फ	फ	ಫ	ಫ	फ	ਫ
फ़		फ़					
ब	ബ	ब	ब	ಬ	ಬ	ब	ਬ
भ	ഭ	भ	भ	ಭ	ಭ	भ	ਭ
म	മ	म	म	ಮ	ಮ	म	ਮ
य	യ	य	य	ಯ	ಯ	य	ਯ
र	ര	र	र	ರ	ರ	र	ਰ
ल	ല	ल	ल	ಲ	ಲ	ल	ਲ
व	വ	व़	व	ವ	ವ	व	ਵ
श	ശ	श	श	ಶ	ಶ	श	ਸ਼
श़			श़				
ष	ഷ	ष	ष	ಷ	ಷ	ष	ਖ
स	സ	स	स	ಸ	ಸ	स	ਸ
ह	ഹ	ह	ह	ಹ	ಹ	ह	ਹ
ळ	ള			ಳ			
ख़							ਖ਼
ग़							ਗ਼

Other Indian Scripts (contd.)

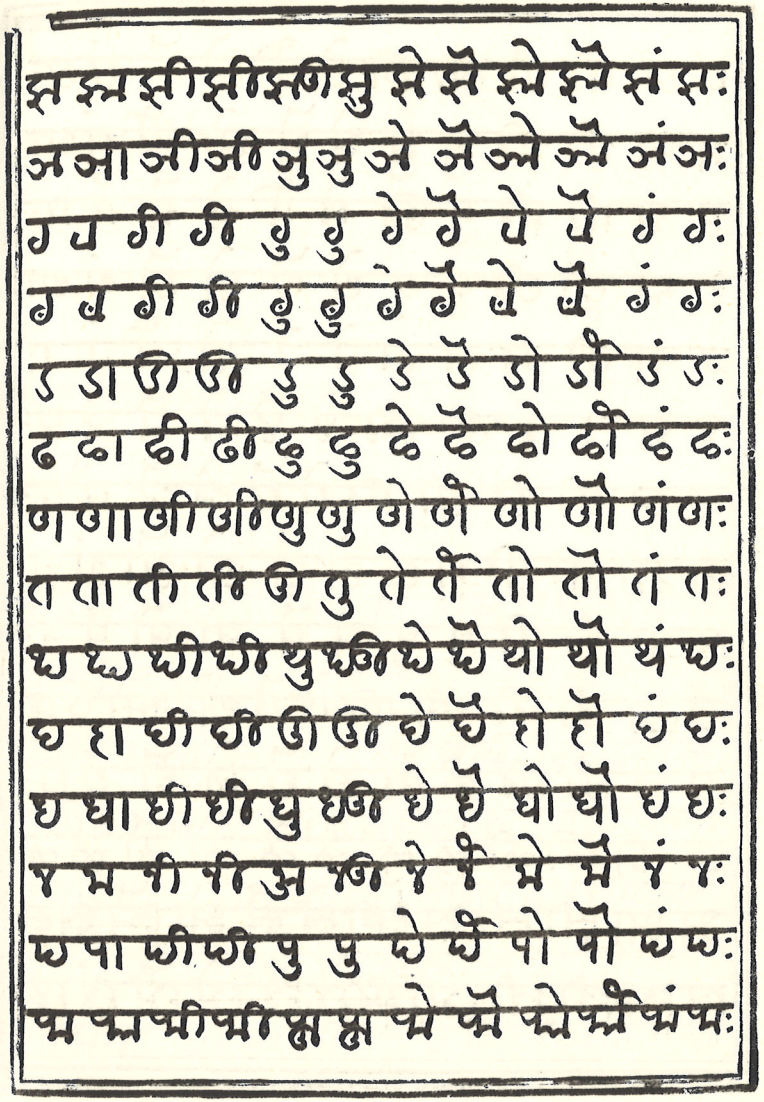
Devanagari	Grantha	Kaithi	Maithili	Tulu	Sarada	Takari	Gurumukhi
ज़							ਜ਼
फ़							ਫ਼
का	കാ	का	का	ಕಾ	क	४	ਕਾ
कि	കി	कि	कि	ಕಿ	कि	४	ਕਿ
की	കീ	की	की	ಕೀ	की	४	ਕੀ
कु	കു	कु	कु	ಕು	कु	४	ਕ਼
कू	കൂ	कू	कू	ಕೂ	कू	४	ਕ਼
के	കെ	के	के	ಕೆ	के	४	ਕੇ
कै	കൈ	कै	कै	ಕೈ	कै	४	ਕੈ
को	കൊ	को	को	ಕೊ	कॉ	४	ਕੋ
कौ	കൌ	कौ	को	ಕೌ	कॉ	४	ਕੌ
कं					कं	४	ਕੰ
कः					कः		ਕਃ
कृ				ಕೃ			
कॄ				ಕೄ			
कॢ				ಕ್ಲ			
कॣ				ಕ್ಲೃ			
१	ക	१	१		१	१	१
२	൨	२	२		२	२	२
३	൩	३	३		३	३	३
४	൪	४	४		४	४	४
५	൫	५	५		५	५	५
६	൬	६	६		६	६	६
७	൭	७	७		७	७	७
८	൮	८	८		८	८	८
९	൯	९	९		९	९	९
०					०	०	०

Other Indian Scripts (contd.)

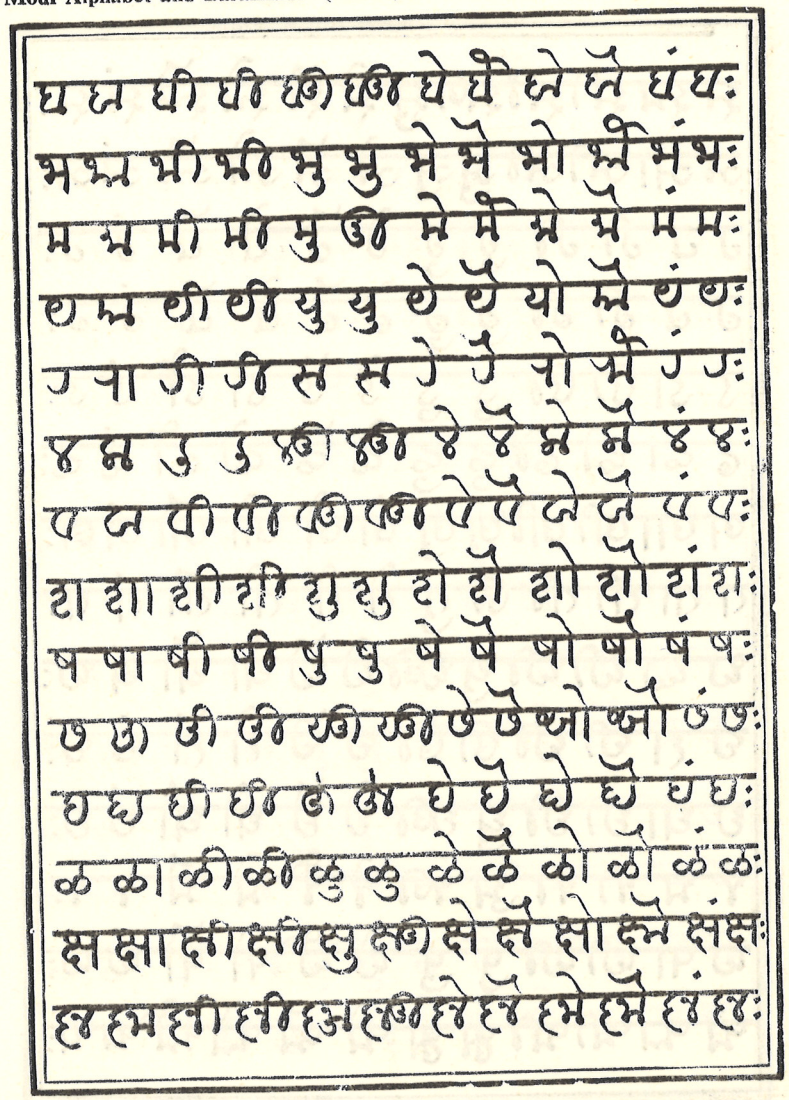
Table 14. **Modi Alphabet and Barakhadi**



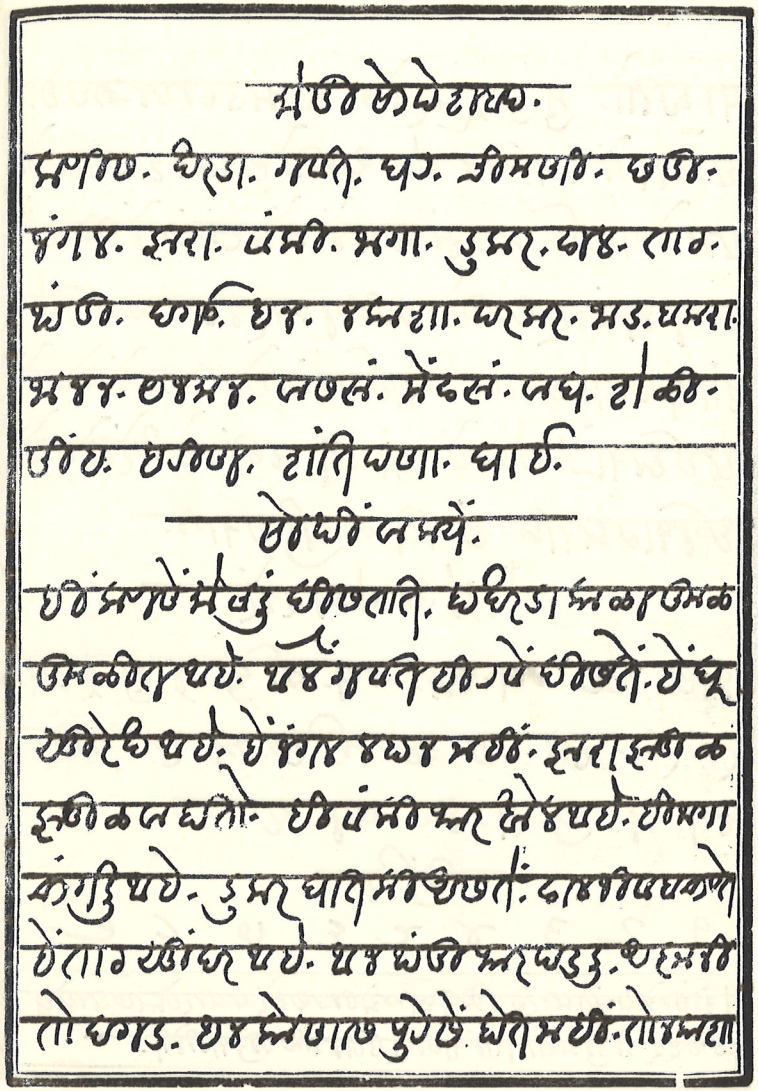
Modi Alphabet and Barakhadi (contd.)



Modi Alphabet and Barakhadi (contd.)



Modi Alphabet and Barakhadi (contd.) **Words and Sentences**



Modi Alphabet and Barakhadi (contd.) Conjuncts and Figures

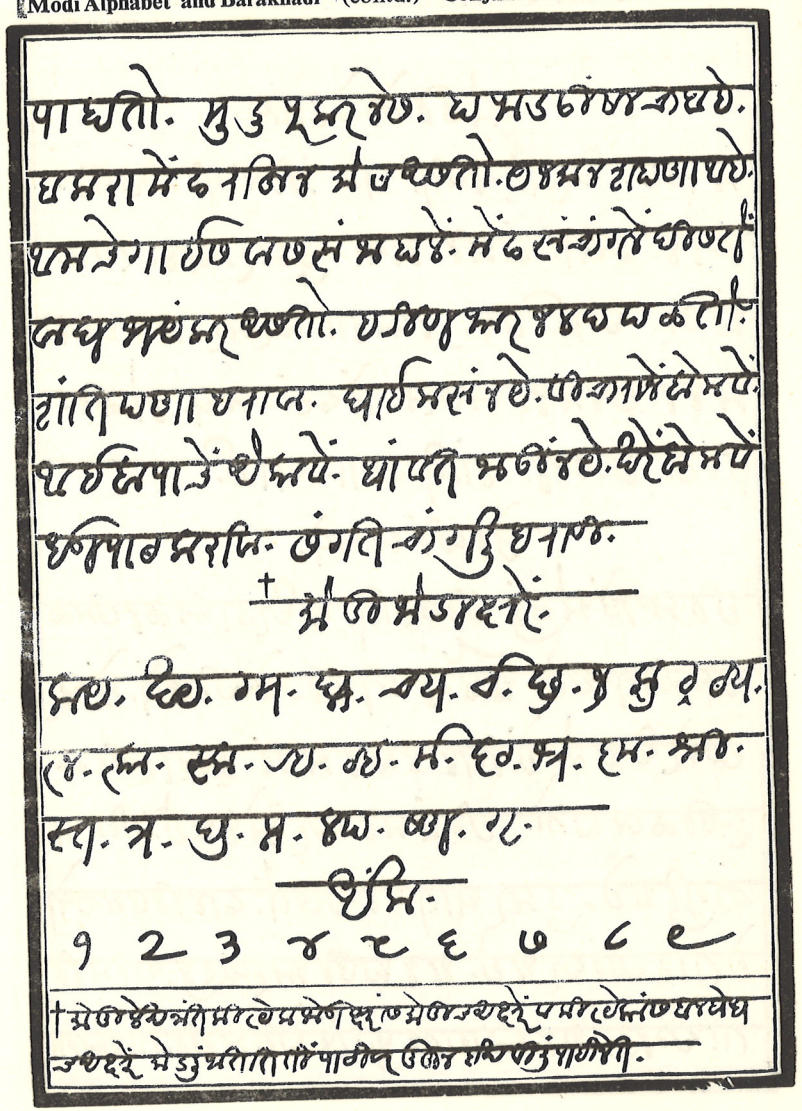


Table 15. **Development of Sharada (Kashmiri) Script.**

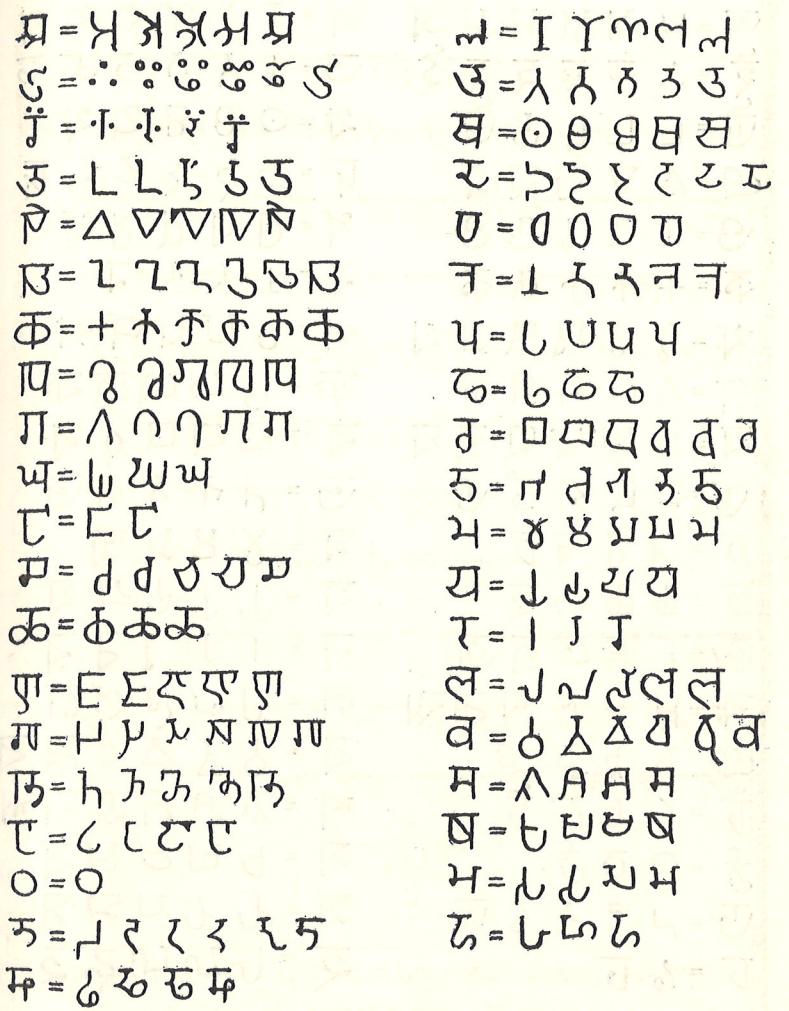


Table 16. **Development of Bengali Script.**

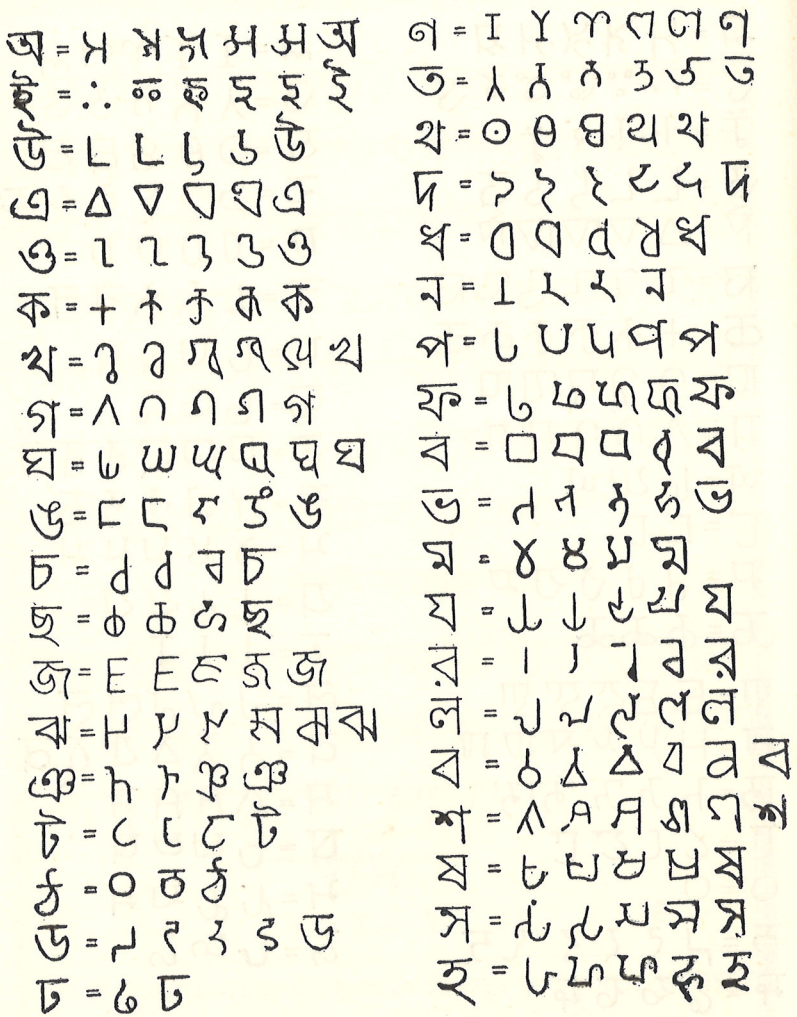


Table 17. **Development of Kannada Script**

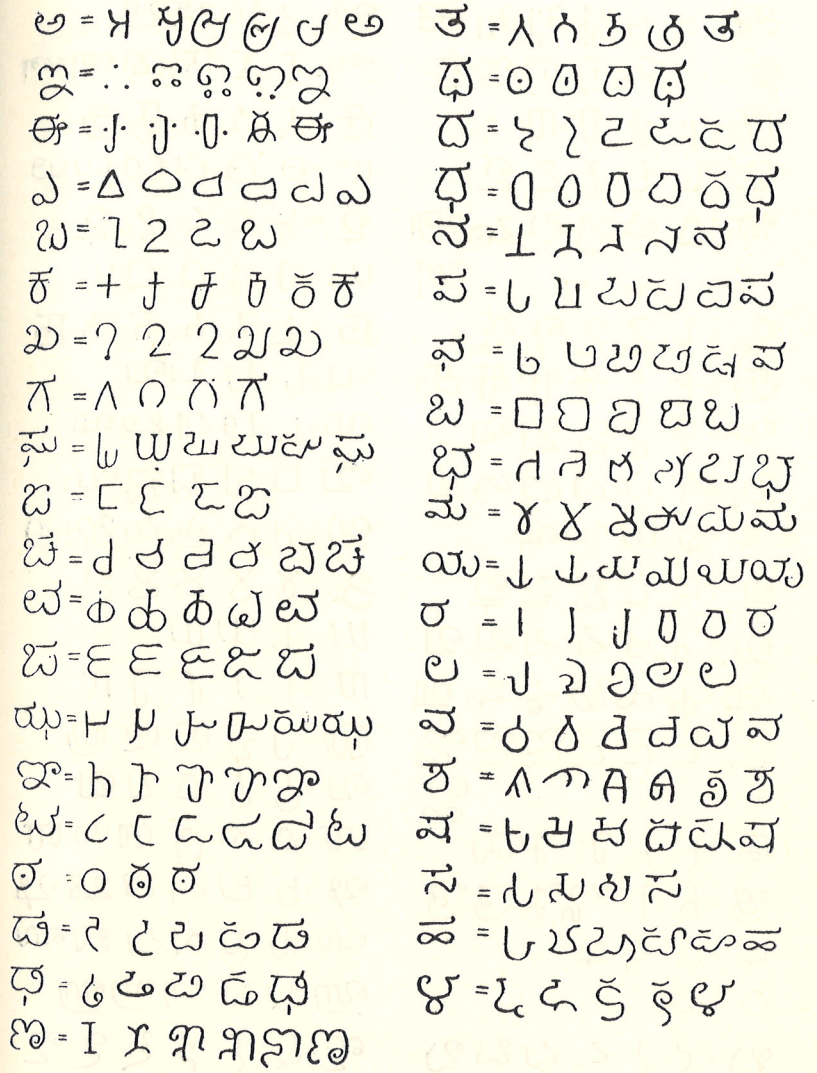


Table 18. **Development of Grantha Script**

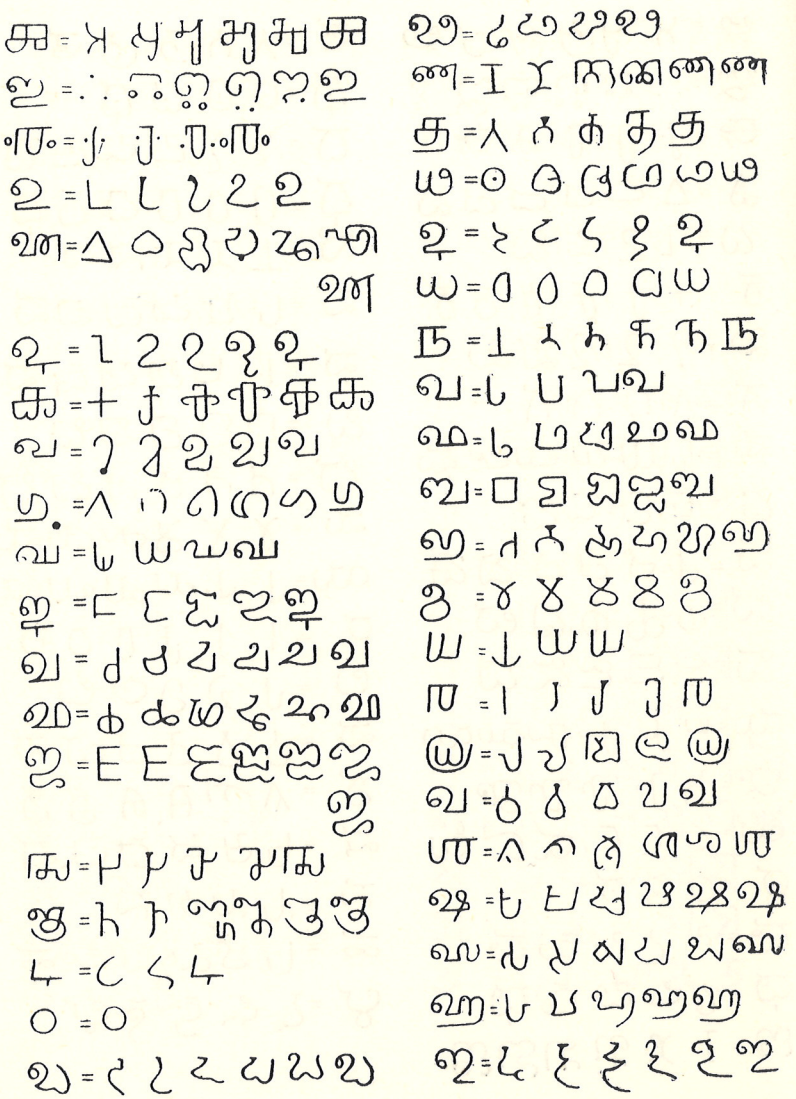
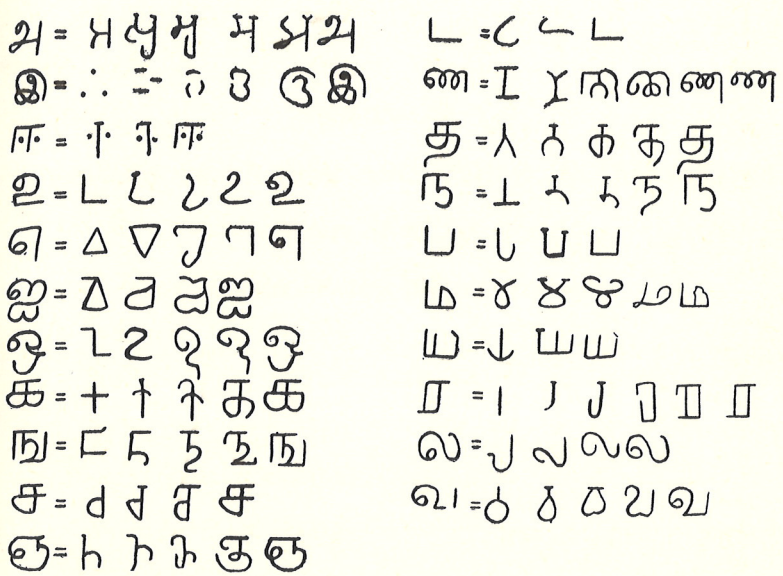


Table 19. **Development of Tamil Script.**



ANNEXURE D

INSCRIPTIONS IN BRAHMI AND OTHER INDIAN SCRIPTS

(*Figures 31 to 53*)

Courtesy : Ojha : *Prāchin Bhāratiya Lipimālā*

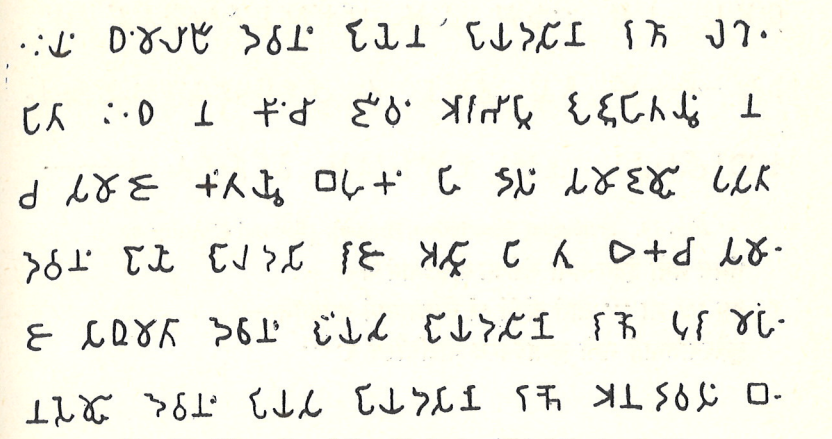


Fig. 31. **Girnar Inscription, Brahmi.** (Third Century B.C.)

[इंय धंमलिपी देवानं प्रियेन प्रियदसिना राजा लेखा
पिता इध न किंचि जीवं आरभित्प प्राजूहितव्यं न
च समाजो कर्तव्यो बहुकं ही दोसं समाजम्हि पसति
देवानं प्रियो प्रियदसि राजा अस्ति पि तु एकचा समा-
जा साधुमता देवान प्रियस प्रियदसिनो राजो पुरा महा-
नसम्हि देवानं प्रियस प्रियदसिनो रा अनुदिवसं ब—

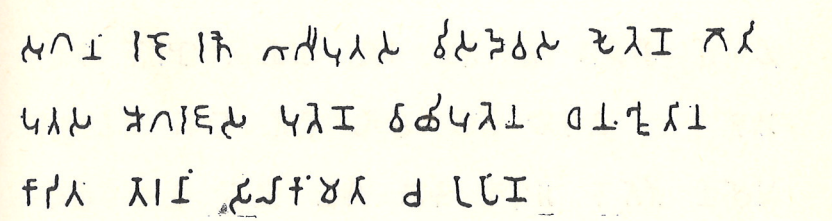


Fig. 32. **Barahut stupa Brahmi Inscription.** (Second Century B.C.)

सुगनं रञे रञो गागीपुतस विसदेवस पौतेण गोति
पुतस आगरजुस पुतेण वाछीपुतेन धनभूतिन
करितं तोरनां (णं) सिलाकंमता च उपंण.

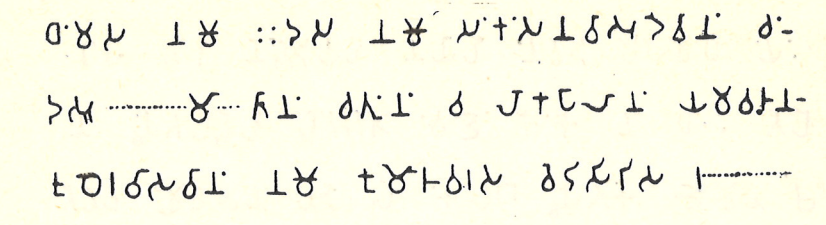


Fig. 33. **Nanaghat Inscription, Brahmi.** (Second Century B.C.)

धंमस नमो इंदस नमो संकंसन वासुदेवानं चं–
दसू ··· मा ··· तातं चंतुंनं चं लोकपालानं यमवरून—
कुबेरवासवानं नमो कुमारुवरस वेढिसिरिस र····

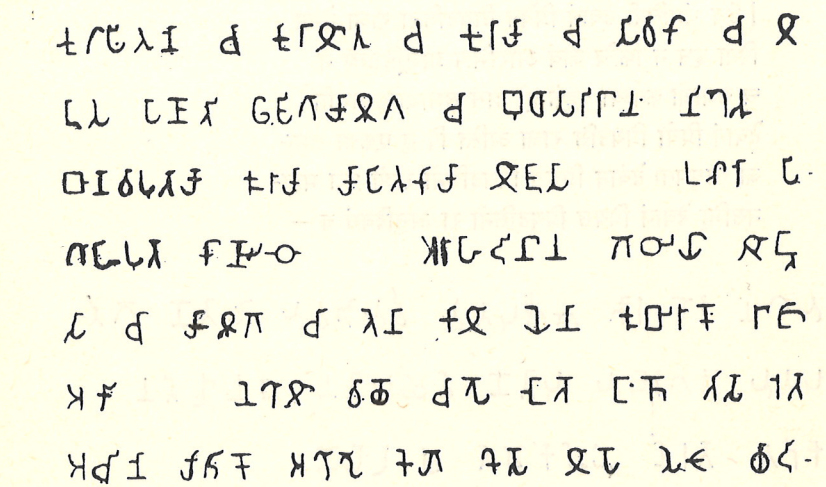


Fig. 34. **Bhattiprolu Stup Stone Vessel Inscriptions, Brahmi.** (Second Century B.C.)

करपितुनो च कुरमातु च कुरष च सिवका च स–
जुसं पणति फाळिग मुगष च बुधसारिरानं निरवेतु
बनवपुतष कुरण षपितुकष मजूम उतारो पि
गहपुतो काणिठो अरह दिनानं गोठिओ मजू
स च षयुगो च तेन कमयेन कुबिरको राजा
अंकि नेगमा वछो चघो जेतो जेसो तिसो रेतो
अचिनो षभिका अखगो केलो केसो महो सहो सेटो छदि

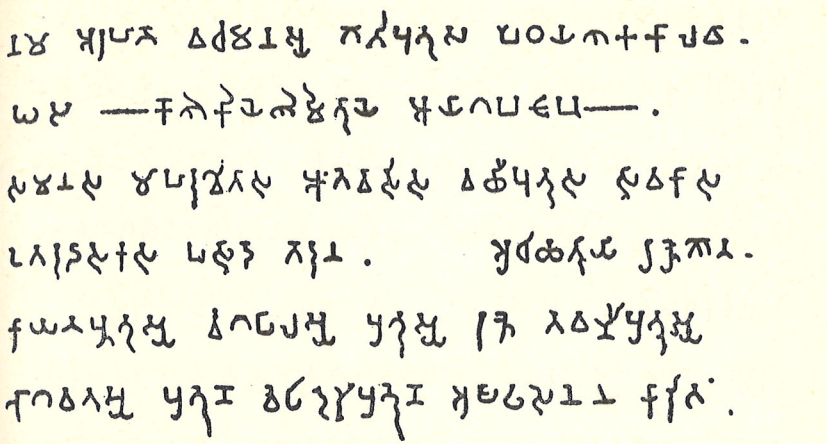


Fig. 35 **Pabhosa Inscriptions Brahmi.** (First century B.C.)

नमो अरहतो वर्धमानस्य गोतिपुत्रस पोठयश कक्कालवा
ळस ···· केशि किये शिमित्राये आयाग पटो प ····
समनस माहर खितास आंतेवासिस वछेपुत्रस सावकास
उतरदासकस पसादो तोरनः अधिछत्राया राओ शोन
कायन पुत्रस्य वंग पालस्य पुत्रस्य रजे (जो) तेवणो पुत्रस्य
भागवतस्य पुत्रेण वैहिदरी पुत्रेण अ (आ) षाढ सेनेन करितं

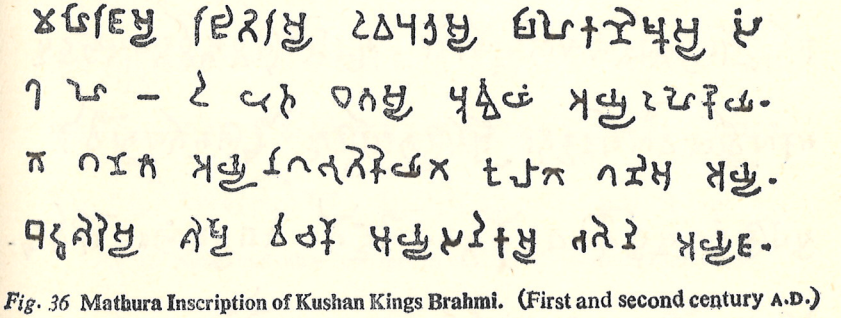


Fig. 36 **Mathura Inscription of Kushan Kings Brahmi.** (First and second century A.D.)

महाराजस्य राजातिरा [ज] स्य देवपुत्रस्य शाहिकाणिष्कस्य सं
७ हे १ दि १०५ एतस्य पूर्व्वे (र्व्वा) यां अर्य्यदेहि किया—
तो गणतो अर्य्यनागभुतिकियातो कुलानो गणिअ अर्य्य
बुद्धशिरिस्य शिष्यो वाचको आर्य्यसंनिकस्य भगिनि अर्य्यज-

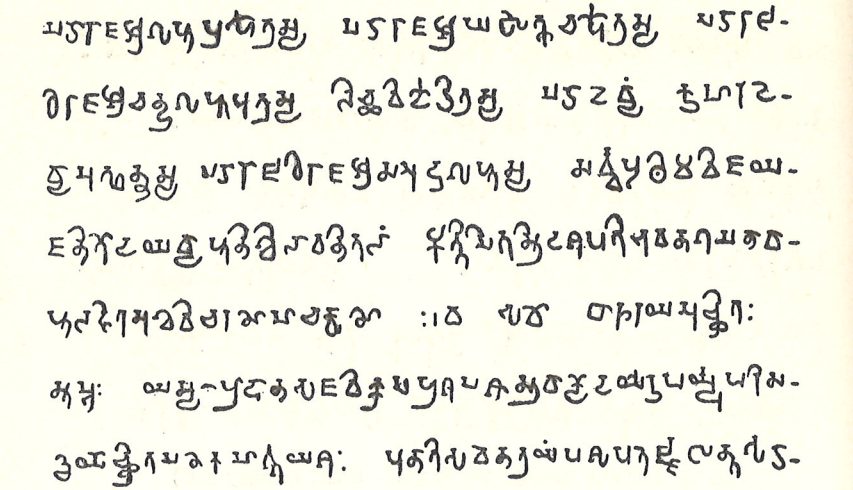


Fig. 37. **Allahabad Pillar Inscription of Samundragupta. Gupta Script.** (Fourth Century A.D.)

महाराज श्रीगुप्तप्रपौत्रस्य महाराज श्रीघटोत्कच पौत्रस्य महाराजाधिराज श्रीचंद्रगुप्त पुत्रस्य लिच्छविदौहित्रस्य महादेव्या कुमार देव्यामुत्फ (प्त) न्नस्य महाराधिराज श्रीसमुद्रगुप्तस्य सर्व्व पृथिवीविजयजनितोदव्याप्तनिखिला वनितलां कीर्तिमित स्त्रिदशपतिभवन गमना वाप्ततळी (डि. लि) तसुखविचरणामाचक्षाण इव भूवो बाहुस्यमुच्छ्रितः स्तम्भः यस्य। प्रदानभुज विक्क्रम प्रशमशास्त्र वाक्योदयैरुपर्य्युपरिस ञ्चयो च्छ्रितमने कमार्ग्ग यशः पुनाति भुवनत्रयं पशुवतेर्ज्जेटार्न्तहा

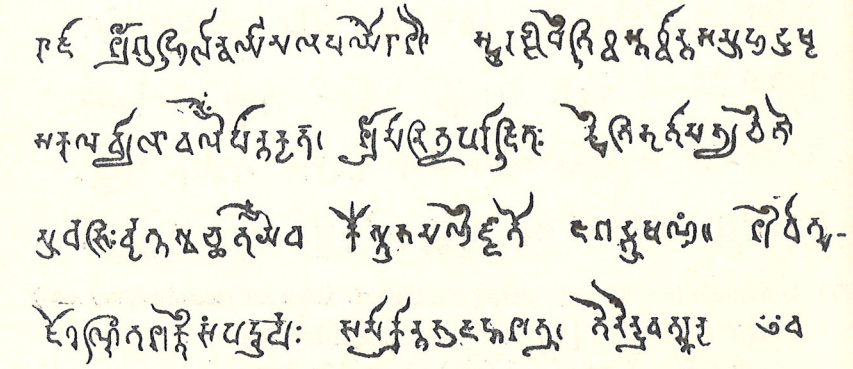


Fig. 38. **Kundeswar Inscription of Aparajeet. Kutila Lipi.** (A.D. 661)

राजा श्रीगुहिलान्वयामलपयो राशौ स्फुरद्दीधितिध्वस्तध्वान्तसमूहदुष्ट सकलव्यालावलेपान्तकृत्। श्रीमानित्य पराजितः क्षितिभृतामर्च्यचितो मूर्धभिः वृत्तस्वच्छतयेव कौस्तुभमणिजीतो जगद्भुषणम्॥ शिवात्म जोखण्डितशक्ति संपद्धुर्यः समाक्रान्त भुजङ्गशत्रु। तेनेन्द्रवत्स्कन्द इव

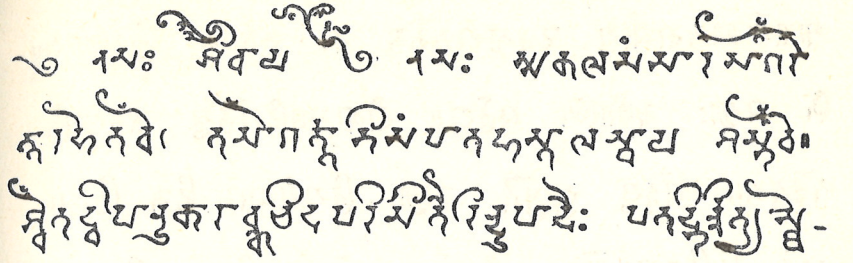


Fig. 39. **Kota Grant Deed of King Shivaggna. Kutila Lipi** (7/8 Century).

ॐनमः शिवाय ॐनमः स्त (स) कल संसार सागरोत्तारहेतवे। तमोगर्ताभिसंपात हस्तालंबाय शंभवे॥
श्वेत द्वापान्दुकारा × क्कचिदपरिमितैरिन्दुपादैः पत द्भिर्न्नित्यस्थै-

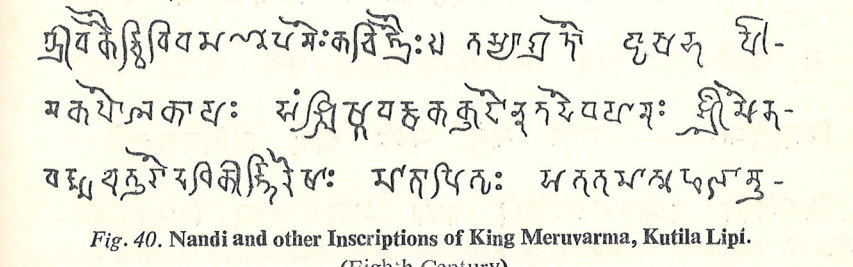


Fig. 40. **Nandi and other Inscriptions of King Meruvarma, Kutila Lipi.** (Eighth Century)

ओ प्रासाद मेरुसदृशं हिमवन्तमूर्ध्निः कृत्वा स्वयं प्रवरकर्म्मशुभैरनेकैः तच्चन्द्रशालरचितं नवनाभनाम प्राग्ग्रीवकैर्व्विविधमण्डपनैः कचित्रैः॥ तस्याग्रतो वृषभ पीनकपोलकायः संश्लिष्टवक्षककुदोन्नत देवयान श्रीमेरुवर्म्मचतुरोदधिकीर्तिरेषाः मातापितृ सततमात्मफ-

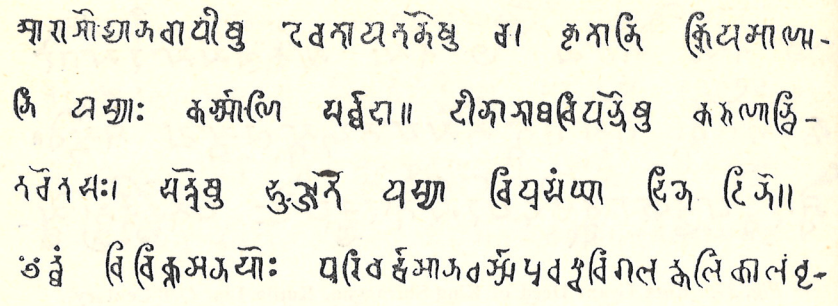


Fig. 41. **Deval Inscription of King Lulla. Nagari Lipi.** (A.D. 992)

आरामोंस्यानवायिषु देवतायतनेषु च । कृतानि क्रियमाणा
नि यस्याः कर्म्माणि सर्वदा ॥ दिनानाथ विपन्नेषु करुणान्वि
त चेत सः । यंत्रेषु भुग्जन्ते यस्या विप्रसंघा दिने दिने
इत्थं विविल्कमनयोः परिवर्द्धमान वर्म्भप्रवत्व विगलत्कालिकालंवृ-

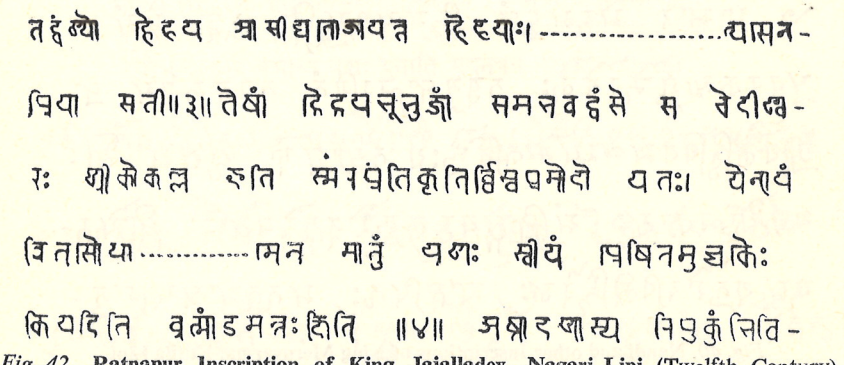


Fig. 42. **Ratnapur Inscription of King Jajalladev. Nagari Lipi.** (Twelfth Century)

[तद्वंश्यो हैहय आसीद्यतोजायन्त हैहयाः । ..... त्यसेन
प्रिया सती ॥ ३ ॥ तेषां हैहय भूभुजां समभवद्वंसे स चेदीश्व-
रः श्री कोकल्ल इति स्मरप्रतिकृतिर्विस्वप्रमोदो यतः । येनायं
त्रितसौया ..... मेन मातुं यशः स्वीयं प्रेषितमुच्चकैः
कियदिति ब्रह्मांडमन्तःक्षिति ॥ ४ ॥ अष्टादशास्य रिपुकुंभिवि-]

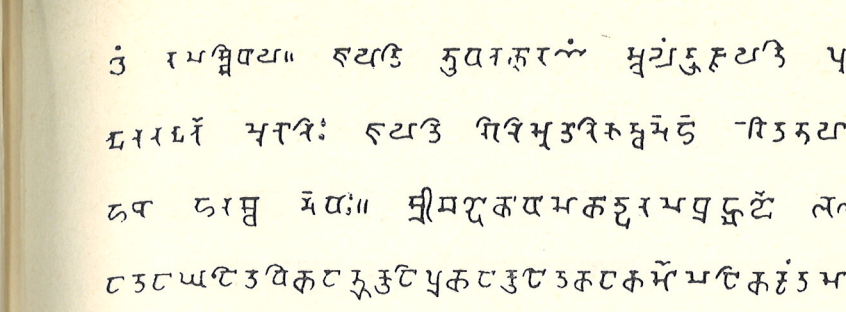


Fig. 43. **Kulait Grant-deed of Somavarma, Sharada Script.** (Twelth Century)

ओनमश्शिवाय ॥ जयति भुवनकारणं स्वयंभूजयति पुर-
न्द्ररनन्दनो मुरारिः जयति गिरिसुतानिरुद्ध देहा रित भयाप
हरो हरिश्च देवाः ॥ श्रीमत्सकावासकात्परमब्रह्मण्यो लला
ट तट घटित बिकट भ्रकुटि प्रकट कुटित कटक सौमटिक कृतसार

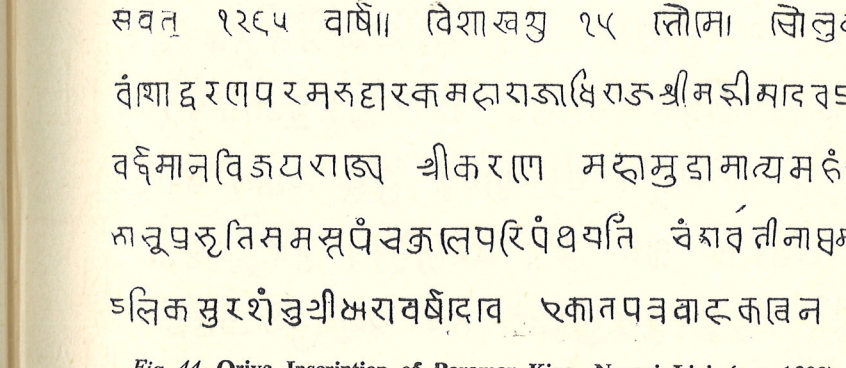


Fig. 44. **Oriya Inscription of Paramar King. Nagari Lipi.** (A.D. 1208)

संवत् १२६५ वर्षे ॥ वैशाख शु १५ भौमे । चौलुक्य
वंशोद्धरणपरमभट्टारकमहाराजाधिराजश्रीमद्भीमदेवप्र
वर्द्धमानविजयराज्ये श्रीकरणे महामुद्रामात्यमहं.–
भाभूप्रभृतिसमस्तपंचकुले परिपंथयति चंद्रावतीनाथमां–
डलिकसुरशंभुश्रीधारावर्षदेवे एकातपत्रवाहकत्वेन

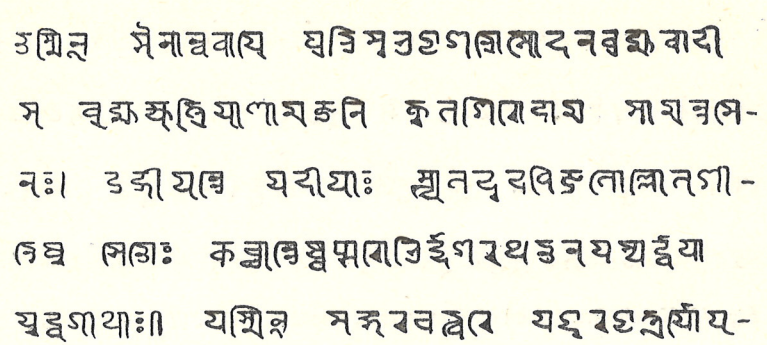


Fig. 45. **Deopara Inscription of Vijayasen, Bangla Lipi** (Tenth and Eleventh Century A.D.)

तस्मिन् सेवान्ववाये प्रतिसुभटशतोत्सादनव्र (ब्र) ह्यवादी
स व्र (ब्र) ह्यक्षत्रियाणामजनि कुलशिरोदाम सामन्तसे-
नः। उद्गीयन्ते यदीयाः स्खलदुदधिजलोल्लोलशी-
तेषु सेतोः कच्छान्तेष्वप्सरो भिर्द्दशरथतनयस्पर्द्धया
युद्धगाथाः॥ यस्मिन् सरङ्गचत्वर पटुरटत्तूर्योप-

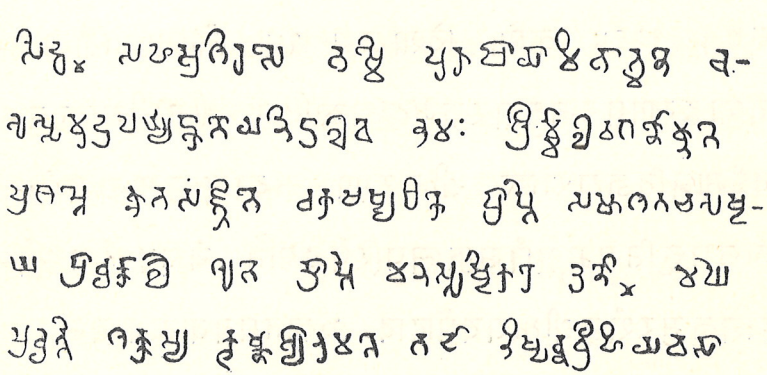


Fig. 46. **Mandasor Inscription of Naravarman, Western Style.** (A.D. 404)

सिद्धम् सहस्रक्षिरसे तस्मै पुरुषायामितात्मने च-
तुस्समुद्रपर्य्यङ्कतोयद्रालवे नमः श्रीम्मालवगणाम्नति
प्रशस्ते कृतसंज्ञिते एकवष्टयधिके प्राप्ते समाशतचतुष्ट-
य (ये) प्रावृक्क (ट्का) ले शुभे प्राप्ते मनस्तुष्टिकरे नृणाम् मधे (हे)
प्रवृत्ते शक्रस्या कृष्णस्यानुमत तद्दा निष्पन्नव्रीहियवसा.

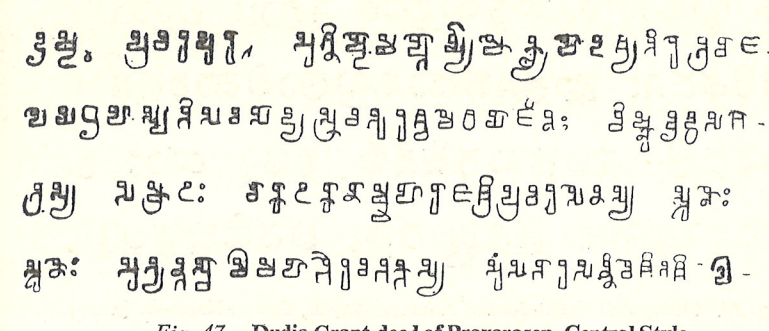


Fig. 47. **Dudia Grant-deed of Pravarasen, Central Style.** (Fifth and Sixth Century A.D.)

दृष्टम् प्रवरपुरात् अग्निष्टोम (मा) प्रोर्य्यामोक्थ्यषोडश्यतिरो (रा) चवाज-
पेयबृहस्पतिसवसाद्यस्कचतुरश्वमेधयाजिनः विष्णुवृद्धसगो-
त्रस्य सम्राटः (जो) वाकाटकानाम्महाराज श्री प्रवरसेनस्य सूनोः
सूनोः अत्यन्तस्वामिमहाभैरवभक्तस्य अंसभारसन्निवेशितशि .... लि-

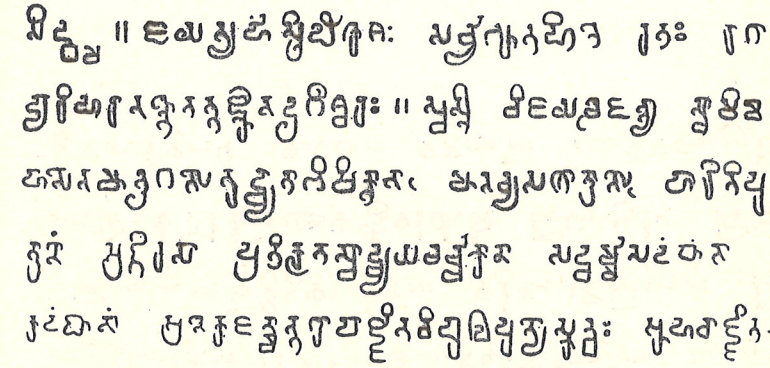


Fig. 48. **Mrigeshvarman Grant-deed, Telugu-Kannada.** (Sixth Century A.D.)

सिद्धम् ॥ जयत्यहंस्त्रिलोकेशः सर्व्वभूतहिते रतः रागा-
द्यरिहरोनन्तोनन्तज्ञानदृगीश्वर : ॥ स्वस्ति विजयवैज [य] न्त्या [:] स्वामिम-
हासेनमात्रगणानुद्ध्या (ध्या) ता भिषिक्तानां मानव्यसगोत्राणां हरितिपु-
त्राणं (णां) अं (आं) गिरसां प्रतिकृतमूवाद्ध्य (ध्या) यच्चर्चकाना (नां) सद्धर्म्मसदंबाना (नां)
कदंबानां अनेकजन्मान्तरोपार्जितविपुल पुण्यस्कन्धः आहवार्जित-

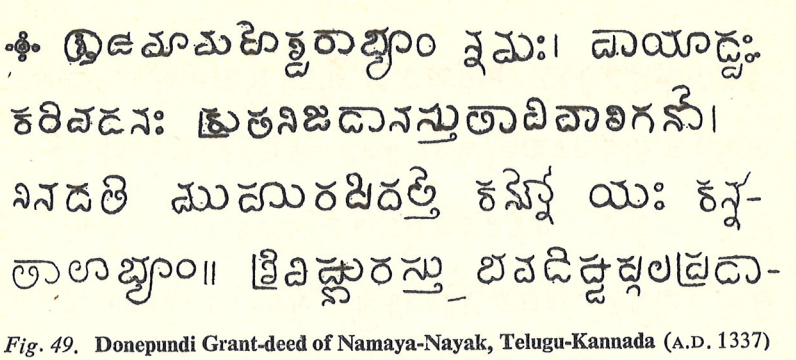


Fig. 49. **Donepundi Grant-deed of Namaya-Nayak, Telugu-Kannada** (A.D. 1337)

श्री उ (श्यु) मामहेश्वराभ्यां न्न (न) मः। पायाद्धः
करिवदनः क्रु(क्र) तनिजदानस्तुताविवालिगणे।
निनदति मुहुरपिधत्ते कर्न्नौ (र्ण्णौ) यः कर्न्न (र्ण)-
तालाभ्यां ॥ श्री विष्णुरस्तु भवद्दिष्टफलप्रदा-

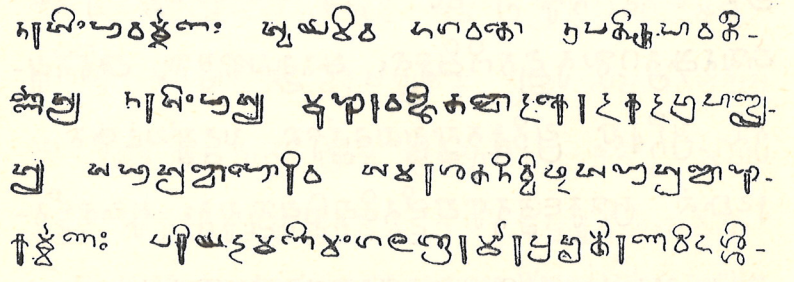


Fig. 50. **Kurama Grant-deed of Parameswarvarman Grantha-Lipi**
(Seventh Century A.D.)

नरसिंहवर्म्मणः स्वयमिव भगवतो नृपतिरूपावती-
र्ण्णस्य नरसिंहस्य मुहुरवजित चोळ (ल) केरण (ल) कळ (ल) भ्रपाण्ड्य-
स्य सहस्रबाहोरिव समरशतनिर्व्विष्टसहस्रबाहु-
कर्म्मणः परियळ मणि मंगल शूर मार प्रभृतिरणाविदश्शि (र्श्शि)-

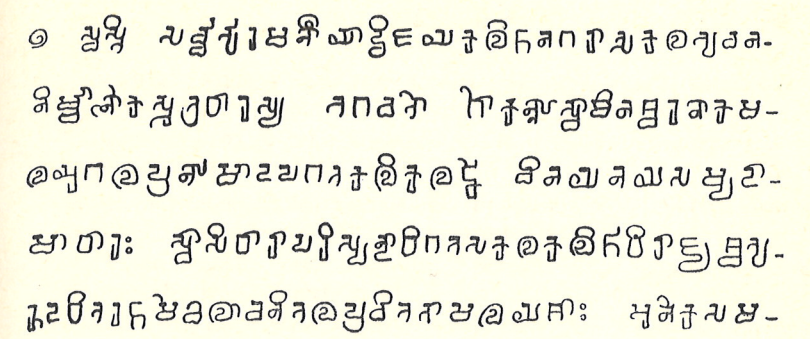


Fig. 51. **Atchyutapuram Grant-deed of Indravarman, Kalinga Script**
(Seventh and Eighth Century A.D.)

आस्वीत सर्व्वर्तुरमणीयाद्विजयकलिंङ्ग नगरात्सकलभुवन-
निर्म्माणैकसूत्रधारस्य भगवतो गोकर्ण्ण स्वामिनश्चरणकम-
लयुगलप्रणामादपगतकल्किकलङ्को विनयनयसम्पदा-
माधारः स्वासिधारापरिस्पन्याधिगतसकलिङ्गाधिराज्यश्चतु-
रुदधितरङ्गमेखलावनितस्नप्रविततामलयशाः अनेकसम-

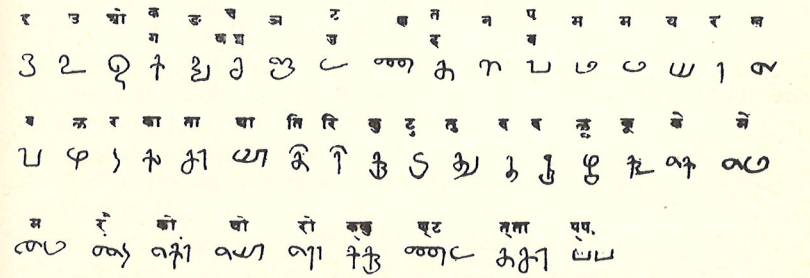


Fig. 52. **Kuram Grant-deed of Parameshvaravarman and other Tamil Copper-plates**
(Seventh and Eighth Century A.D.)

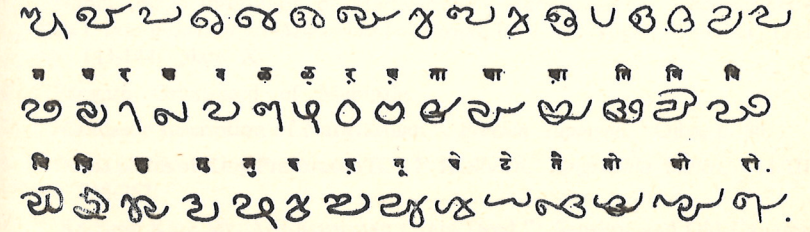


Fig. 53. **Veeraraghava Grant-deed Vettelulu Lipi.** (Fourteenth Century A.D.)

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23. *See* ref. 19.

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26. Diringer David, *The Alphabet*.

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28. Tayler, *Alphabet*, p. 299 (footnote 1.)

29. 'तथा अस्वरं व्यंजनं भवति' *Sutra* 1, Hemchandra, *Prakrit Vyakarana*.

30. तेन ऋ, ॠ, ऌ, ॡ, ऐ, औ, ङ, ञ, शं, ष, विसर्जनीय प्लुत वर्जो वर्ण समाम्नायो लोकाद् अवगन्तव्यः। *Ibid*.

31. **दीर्घ ऱ्हस्वौ मिथो वृत्तौ** : वृत्तौ समासे स्वराणां दीर्घ ऱ्हस्वौ बहुल भवतः मिथः परस्परम्। उदा० अन्वेदिः = अन्तावेई।, सप्तविंशतिः = सत्ताविसा जु वई अणो।, वारी मई = वारि मई.

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33. Census of India, Vol. I, Part II C (*ii*).

CHAPTER V

ORIGIN AND DEVELOPMENT OF INDIAN NUMERALS

107. James Prinsep, the first Indologist to decipher Brahmi letters, was of the opinion that the signs used for numbers were the first letters of the words denoting the numbers. Pandit Bhagavanlal believed that the signs for numbers from 4 onwards were actually the letters.[1] Dr. Bühler says that the graphic forms representing the numbers were invented by the Brahmins as they contain the graphemes of *anunāsik*, *jihvāmūlīya* and *upadhmānīya*.[2] Dr. Burnell (and also Dr. Bühler) argued that the Hindus picked up the graphemes for the numbers from foreign sources. Burnell opined that the Indian numerals were letters derived from Indo-Bactrian alphabet. Pandit Gaurishankar Ojha has taken great pains to disprove these theories of foreign origin, by giving a comparative table of the graphemes used in the Hieroglyphic, Phoenician, Hieretic, Demotic and the Indian Systems[3] (*see Table 20*).

DECIMAL SYSTEM OF NUMBERS

108. The place-value given to the 'zero' by the Hindus proved to be a most fruitful invention. Since the Vedic period the Hindus are practising the decimal system of numbers. A. B. Walawalkar has pointed out: "The *Yajus*, *Maitrāyani*, *Katha* and *Taittiriya Saṁhitās* contain a full list of names of all Sanskrit numerals from 1 to 10 and 10^1 to 10^{18} (*ekam* to *purardha*). It is interesting to know that Lord Buddha could count *powers* of 10 up to 10^{53}".

LETTERS TO REPRESENT NUMBERS

109. The system of indicating the numbers with words was current during the Vedic period. The word *Kṛta* is used in *Śatapatha*[4] and *Taittiriya*[5]. *Gāyatri* and *Jagati* have been used to indicate the numbers 24 and 48 respectively by *Kāttyāyana*.[6] The *Vedānga Jyotish*[7] uses the words *Rūpa*, *Aya*, *Guna*, *Yuga*, *Bhasamūha* for the numbers 1, 4, 8, 12 and 27. *Āryabhatiya*, a treatise on astronomy, gives a complete system of representation of numbers with letters.[8] The number equivalents of letters of the alphabet in this system are given on page 159.

Table 20. **Comparative Table of Numerals.**

HIEROGLYPHIC, SEMETIC AND INDIAN STYLE NUMERALS

	Hieroglyphic	Phoenician	Hieretic	Demotic	FROM INDIAN INSCRIPTIONS				
					Asokan	Nanaghat	Kushan	Kshatrap & Andhra	
१	I	I	𐤀	𐤀		–	··	–	1
२	II	II	𐤁	𐤁		=	=	=	2
३	III	III	𐤂	𐤂		≡	≡	≡	3
४	IIII	IIII	𐤃	𐤃	+	⊀ ⊀	ㄣ ㄣ	⊀ ⊀ ⊀	4
५	IIIII	IIIII	𐤄	𐤄	६ ६		ㄣ ㄣ ㄣ	ㄣ ㄣ ㄣ	5
६	IIIIII	IIIIII	𐤅	𐤅		⊀·	६६६	६	6
७	IIIIIII	IIIIIII	𐤆	𐤆		⊀	⊀ ⊀ ⊀	⊀ ⊀	7
८	IIIIIIII	IIIIIIII	𐤇	𐤇			ㄣ ㄣ ㄣ	ㄣ	8
९	IIIIIIIII	IIIIIIIII	𐤈	𐤈		⊀	⊀	⊀	9
१०	∩	⊃	𐤉	𐤉		⊀⊀	⊀⊀⊀	⊀⊀⊀	10
११	∩I	⊃I	𐤊						11
१९	∩IIIIIIIII	⊃IIIIIIIII	𐤋						19
२०	∩∩	⊃⊃	𐤌	𐤌		⊀	⊀ ⊀ ⊀	⊀	20
३०	∩∩∩	⊃⊃⊃	𐤍	𐤍			⊀⊀⊀		30
४०	∩∩∩∩	⊃⊃⊃⊃	𐤎	𐤎			⊀⊀⊀		40
५०	∩∩∩∩∩	⊃⊃⊃⊃⊃	𐤏	𐤏	⊀ ⊀		⊀ ⊀ ⊀		50
६०	∩∩∩ ∩∩∩	⊃⊃⊃⊃⊃⊃	𐤐	𐤐			⊀⊀⊀		60
७०	∩∩∩ ∩∩∩∩	⊃⊃⊃⊃⊃⊃⊃	𐤑	𐤑			⊀⊀	⊀	70
८०	∩∩∩∩ ∩∩∩∩	⊃⊃⊃⊃⊃⊃⊃⊃	𐤒	𐤒		⊀	⊀ ⊀ ⊀		80
९०	∩∩∩ ∩∩∩ ∩∩∩	⊃⊃⊃⊃⊃⊃⊃⊃⊃	𐤓	𐤓			⊀ ⊀		90
१००	9	𐤔	𐤔	𐤔		⊀		⊀	100
२००	99	𐤕	𐤕	𐤕	⊀ ⊀ ⊀	⊀		⊀	200
३००	999		𐤖	𐤖		⊀			300
४००			𐤗	𐤗		⊀			400
५००			𐤘	𐤘				⊀	500
७००			𐤙	𐤙		⊀			700
१०००		5	𐤚	𐤚		⊤		⊀	1000
२०००			𐤛	𐤛				⊀	2000
३०००			𐤜	𐤜				⊀	3000
४०००			𐤝	𐤝		⊀			4000

Table 21. **Number equivalents of Letters**

क् = १ च् = ६ ट् = ११ त् = १६ प् = २१ य् = ३० ष् = ८०
ख् = २ छ् = ७ ठ् = १२ थ् = १७ फ् = २२ र् = ४० स् = ९०
ग् = ३ ज् = ८ ड् = १३ द् = १८ ब् = २३ ल् = ५० ह = १००
घ् = ४ झ् = ९ ढ् = १४ ध् = १९ भ् = २४ व् = ६०
ङ् = ५ ञ् = १० ण् = १५ न् = २० म् = २५ श् = ७०
अ = १; इ = १००; उ = १०,०००; ऋ = १०,००,००० ;
ऌ = १०,००,००,०००; ए = १०,००,००,००,०००;
ऐ = १०,००,००,००,००,०००; ओ = १०,००,००,००,००,००,००० ;
औ = १०,००,००,००,००,००,००,०००.

110. The consonants without a vowel indicate the numbers shown against each. When the consonants are followed by a vowel the number indicated by the consonant is to be multiplied with that indicated by the vowel, i.e. कु=क्+उ=1 × 10,000=10,000; णि=ण+इ=15 × 100=1500. There are no number equivalents for long vowels. In case of consonant clusters not followed by a vowel, the numbers indicated by them are to be added. In case of a conjunct followed by a vowel the numbers indicated by each of the consonants is to be multiplied by the number indicated by the vowel and the sums added up, i.e. ख्यु=खु+यु= (ख् × उ) + (य् × उ). This method was very convenient due to the economy in the writing space.

Ka-Ta-Pa-Yadi System

111. Āryabhata the second, mentions a different system of letters.[9]

Table 22. ***Ka-Ta-Pa-Yadi*** **System of Aryabhata**

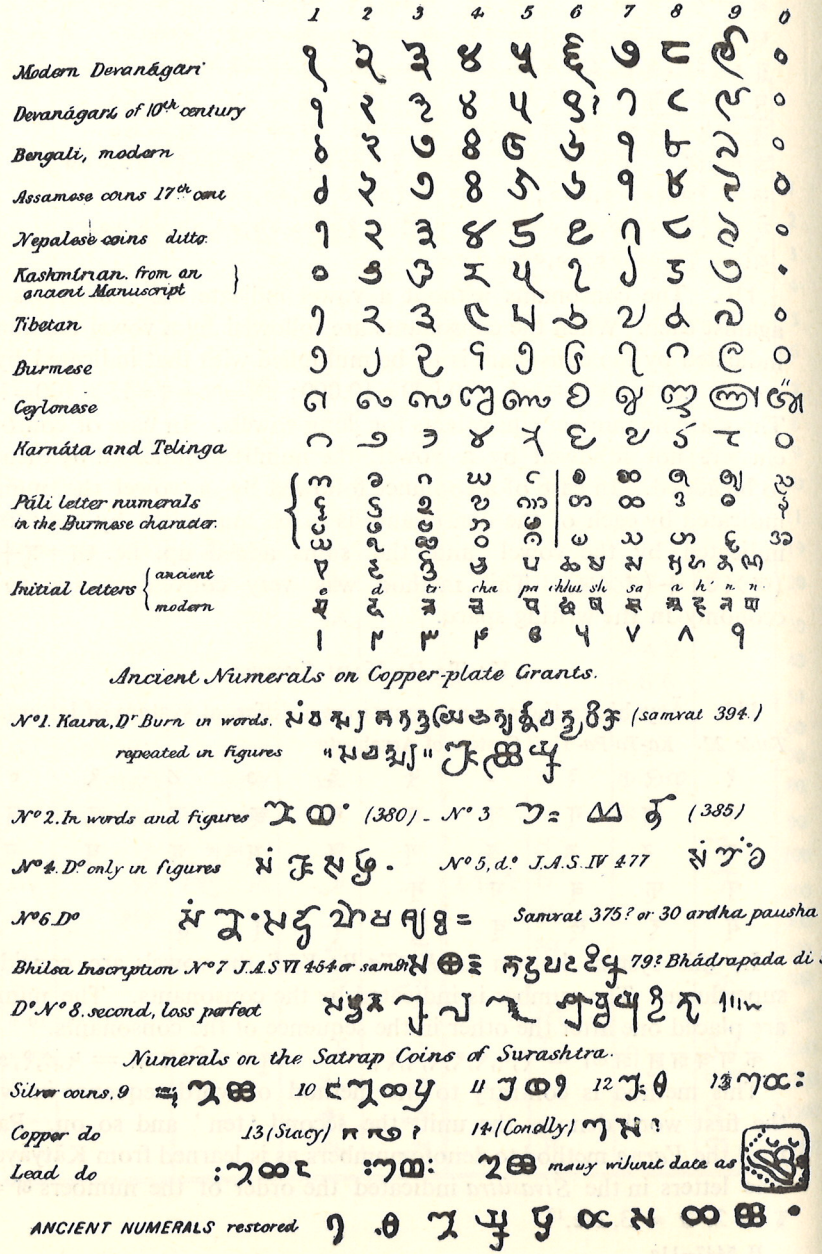
१	२	३	४	५	६	७	८	९	०
क्	ख्	ग्	घ्	ङ्	च्	छ्	ज्	झ्	ञ्
ट्	ठ्	ड्	ढ्	ण्	त्	थ्	द्	ध्	न्
प्	फ्	ब्	भ्	म्					
य्	र्	ल्	व्	श्	ष्	स्	ह		

In this system known as *Ka-Ta-Pa-Yādi*, the vowels are considered superfluous. The number is indicated by the consonants. The numbers are placed one after the other in the sequence of the consonants.[10]

क ण ध झ झु झि ला = १,५,९,९,९,९,३; मु न य सि न धा = ५,८,१,७,०,९

This method is contrary to the method of word sequence in which the first word denotes the unit, the second 'ten' and so on. Panini used the *Varṇa* method to denote numbers as is learned from Kātyāyan[11]. The letters in the *Śivasūtra* indicated the order of the numbers अ = 1, इ = 2, उ = 3, etc.[12]

Table 23. **Princep's Table of Sanskrit and other Numerals in Copper plate Grants**


1 2 3 4 5 6 7 8 9 0
Modern Devanágari
Devanágarí of 10th century
Bengali, modern
Assamese coins 17th cent
Nepalese coins ditto
Kashmirian. from an ancient Manuscript
Tibetan
Burmese
Ceylonese
Karnáta and Telinga
Páli letter numerals in the Burmese character
Initial letters ancient
modern
Ancient Numerals on Copper-plate Grants.
N°1. Kaira, D° Burn in words (samvat 394) repeated in figures
N°2. In words and figures (380) - N°3 (385)
N°4. D° only in figures
N°5, d° J.A.S. IV 477
N°6 D°
Samvat 375? or 30 ardha pausha
Bhilsa Inscription N°7 J.A.S VI 464 or samb
79? Bhádrapada di 5
D° N°8. second, less perfect
Numerals on the Satrap Coins of Surashtra.
Silver coins. 9 10 11 12 13
Copper do 13 (Stacy) 14 (Condly)
Lead do many without date as
ANCIENT NUMERALS restored

Numbers in Inscriptions

112. It has been conclusively established on the basis of the epigraphic evidence that the Hindus had different signs for the figures 1 to 9, and separate signs for the numbers 10, 20 and so on up to 90, 100 and 1,000. They had no sign for 1,00,000. The earliest use of figures is noticed in the Asoka inscriptions, wherein the signs for the numbers 200, 50 and 6 are found. It would be seen that with the twenty signs, referred to above, the sums 1 to 99,999 could be written. The method of writing the numbers beyond 10 up to 99 was to add the numbers for 1, 2, etc., after the sign for 10, 20 and so on.* The numbers 200 and 300 used to be represented by adding to the sigr for 100 one and two small lines respectively. The numbers 400 to 900 were represented by joining the signs of 4 to 9, to the sign for 100, by a horizontal joint. The numbers above 100 were represented by placing the sign for 'tens' and units after the sign for hundred, i.e., the sum 126 was written with the signs for 100, 20, and 6, placed in that order. The signs for 1,000 used to be constructed the same way as 100 to 900.

113. The numbers 1 to 3 were represented by horizontal lines and the numbers 4 onwards had distinct signs which resembled the Brahmi letters as shown in the following table :

Table 24. **Method of denoting Numbers followed in the Inscriptions.**[13]

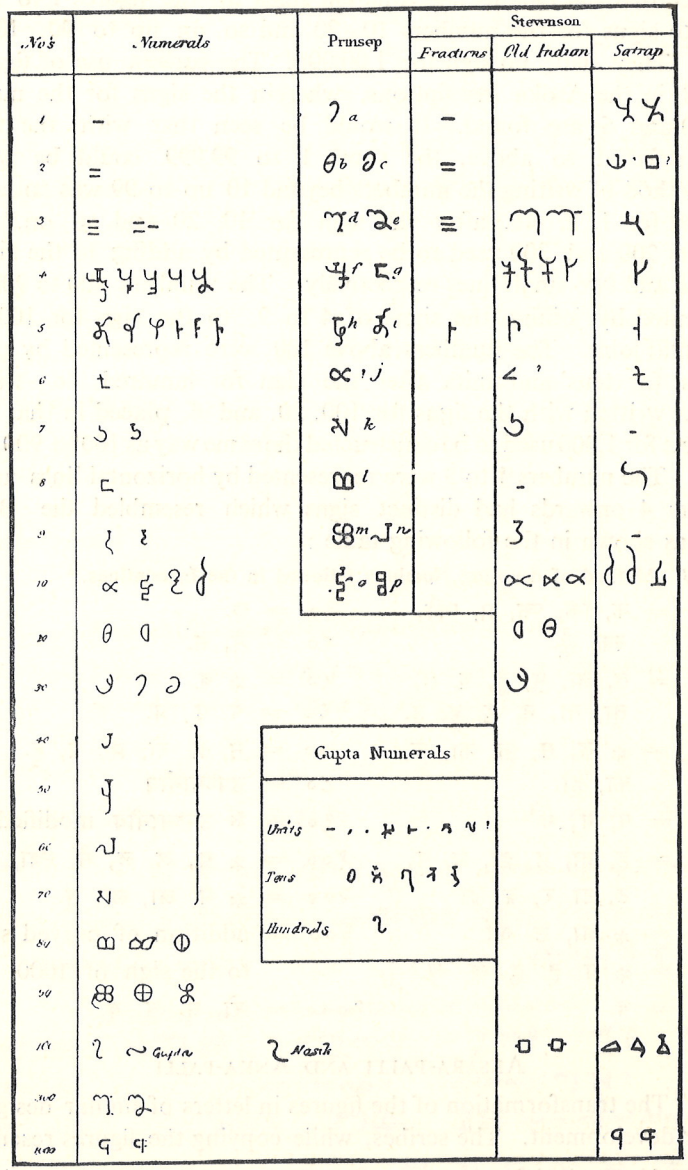
४ =	क, क्क, क्कृ, ग्र, क्की, ल्क, ट्क.	३० =	ल.
		४० =	त, स.
५ =	त, ता, पु, हु, रु, तृ, तॄ, ना, न, ह्न, ह्र, ह.	५० =	* ब.
		६० =	प, पु, प्र.
६ =	* ज, स, फ, फा, फ, फा, हा.	७० =	त, प्र, रो, प्रा, प्र, ह्र.
		८० =	उपध्मानीय
७ =	ग्र, गु, ग.	९० =	* उपध्मानीय modified
८ =	ह्र, ह्रा, ह, हा, उ, पु, ट, टा र, व्र, द्रा	१०० =	* सु, अ, लु, से, स्त्रो, स्त्रों.
		२०० =	* सु, आ, ला, सू.
९ =	* ओ, उ, ओं.	३०० =	addition of curved strokes to the sign of 1000
१० =	* र्य, ह, ह्न, ख, ल्र.		
२० =	थ.	१००० =	रो, धु, चु, वु.

Aksara-palli and Anka-palli

114. The transformation of the figures in letters of similar design was of later development. The scribes, while copying the figures resembling

* *See* Table 32 mixed figures.

Table 25. **Numerals used in Inscriptions.**



the Brahmi letters, have added further forms to the list due to incorrect appreciation of the number system in use. They substituted the letters and one-letter words to represent the numbers 1 to 3.

Numbers	1	2	3
Words	ए (एक)	द्वि	त्रि
Letters	स्व	स्ति	श्री
	ॐ	न	म :

The method of representing the numbers with letters was known as *Akṣara-palli* and the normal figure-signs were known as *Anka-palli.* These two methods were at times used together, placing the signs one below the other, i.e.,

ला	सु	सू
३३ = ३;	१३१ = ला;	२०९ = ०
	१	ॐ

Introduction of Zero

115. The exact date of introduction of zero in the Indian numerals is not yet conclusively established. Varāhamihara clearly mentions this method in *Panca-Sidhāntikā* (A.D. 505). The new style is followed in the *Bhūrja-Pattra* MSS. of an arithmetical work found at Bakhshali in the Yūsufzāī sub-division of Peshawar District[14] dating back to the third century according to Dr. Hornell. This device is first noticed in the grant-deeds of the seventh century. The new method was firmly established from the tenth century. Alberuni records that in his times the Hindus were leading in Arithmetic.[15]

Taylor's Account of Origin of Number Signs

116. Horizontal lines are used in the Asoka inscriptions for numerals 1, 2 and 3. In Sanskrit 'four' is *chatur*, and the cave cipher for four closely resembles the Indo-Bactrian letter which has the power of *ch*. The Indo-Bactrian letter *p* (Sanskrit प) is used for 5 in the cave inscriptions. Six and seven are *sas* and *saptan* in Sanskrit, and here again the cave numerals closely resemble two of the Indo-Bactrian sibilants. The sibilants appear, however, to have been interchanged. The ciphers for 8, 9 and 10 do not resemble the letters. It has been argued that the cipher for 8 is the conjectual ligature *aṣ*, standing for *aṣtan*, 'eight'; that for 9 is the initial of *navam*, '*nin*', and the cipher for 10, which is found in a Punjab inscription, written in the reign of Kanishka, is *d*, the initial of *daṣan*, 'ten'. The fourteenth century ciphers were practically identical with those now in use. The first column in Table 26 contains the earliest European forms, from MSS. of the twelfth

Table 26. **European, Gobar and Indian-Arabic Ciphers.**

THE ARABIC CIPHERS						LETTERS OF THE INDO-BACTRIAN ALPHABET
EUROPEAN		GOBAR	INDIAN			
Sec. xiv.	Sec. xii.	Sec. x.	Sec. x.	Sec. v.	Sec. i. A.D.	Sec. ii. B.C.
1	২	1	৭	⌒	—	
2	২	২	২	⌒⌒	=	
3	३	३	३	⌒⌒⌒	≡	
4	৪	৪	४	५	⊀	𐨤 = chh
5	৫	५	५	⊦	⊦	𐨪 = p
6	৬	৬	६	৬	৬	𐨬 = s
7	৭	৭	७		⊃	𐨭 = ṣ
8	৮	৮	८		⊃⊃	𐨨 = aṣ?
9	৯	৯	९		২	𐨣 = n
0	০	·	০			𐨯 = d

century. The *Gobar* numerals of the Arabs come next. The three following columns show the Indian ciphers of the tenth, fifth and first centuries A.D. and these are followed by the suggested alphabetic prototypes, taken from the Indo-Bactrian coins and inscriptions of the second and first centures B.C.[16]

117. Sanskrit numerals are slightly modified forms of the numerals used in inscriptions of the *Vengi* dynasty which belongs to the fourth or fifth century A.D. These again can be traced to the numeral signs used in the inscriptions of the western caves, which are assigned to the first and the second centuries of our era The signs for the three first numerals are said to be of more doubtful origin. In the cave inscriptions these numbers are denoted by — = ≡ from which the curved *Vengi* symbols were manifestly obtained. From these it is quite possible that the tenth century Devanagari ciphers may have been derived. The ciphers for 1, 2 and 3 appear to have been derived from the initial letters of the words *eka*, *dva*, and *tri*, to which they bear some resemblance. Bayley argues that the Indian numeral system was of "an eclectic character", some signs being of Egyptian origin, others Phoenician, and some possibly cuneiform. The numerals for 4, 5, 6, 7, 8, 9, he considers, to be the Bactrian letters *chh*, *p*, *g*, *a*, *b*, *h*.[17] M. Bertin believes that the Indian ciphers were developed in India out of the Egyptian system.[18]

Dr. Raghuveer on Indian Numerals

118. "The accompanying (Table) 27 shows the numerals of the main Indian languages. Among these, the Tamil numerals are of rare interest for they have partly preserved the old system of denoting numbers by the letters of the alphabet. The Tamil numbers begin with K for one. U is the symbol for two. It might be the first letter of "*ubayam*" meaning two. E stands for seven. It is the first letter of "eru" which means seven in Tamil. Other numerals need long explanations. The letter four falls in line with Malayalam, Kannada, Telugu and Devanagari. It is said that in Tamil, the ancient numerals have been given up in preference to the English ones (usually known in England as Arabic or sometimes more accurately as Hindu numerals). The use of English numerals has not become universal in other southern languages. Numerals are an essential part of the writing of a nation. When we adopt Devanagari as the national script of the Centre, it follows naturally that the numerals should be Devanagari. Culturally we would be failing in our duty if we repudiate our own symbols and adopt the symbols used in the European languages."[19]

Table 27. **Numerals in Indian Scripts (compiled by Dr. Raghuveer)**

	1	2	3	4	5	6	7	8	9	0
ASOKA	—	=	≡	+	ㄏ	ε	ㄱ	ㅂ	?	
NĀGARĪ	१	२	३	४	५,५	६	७	८,८	९,९ ९	०
MODI (MARATHI)	१	२	३	४	५	६	७	८	९	०
GUJARATI	૧	૨	૩	૪	૫	૬	૭	૮	૯	૦
ORIYA	୧	୨	୩	୪	୫	୬	୭	୮	୯	୦
BENGALI	১	২	৩	৪	৫	৬	৭	৮	৯	০
PANJABI	੧	੨	੩	੪	੫	੬	੭	੮	੯	੦
TAMIL	௰	௨	௩	௪	௫	௬	௭	௮	௯	௦
MALAYALAM	൧	൨	൩	൪	൫	൬	൭	൮	൯	൦
CANARESE	೧	೨	೩	೪	೫	೬	೭	೮	೯	೦
TELUGU	౧	౨	౩	౪	౫	౬	౭	౮	౯	౦

119. "In Shaka year 427 (A.D. 505) Varāhamihara in his *Pancha-siddhāntikā* uses the decimal system freely. After him the system was taken by an Indian Ambassador to the Court of Baghdad in the eighth century A.D. In the ninth century, Alkhvarizmi, an Arab author, described the decimal system. After that it was taken by the Arab conquerors to Europe. The Arabs call the numerals *Hind sa* (after Hind). In Arab countries, the numerals were written in the Indian order from right-hand side to left (अंकानां वामतो गतिः) and not in the semitic order".[20]

Influence of Indian Sciences in Arab Countries

120. Epigraphic evidence shows that the influence of the Indian sciences, particularly that of Brahmi script, resulted in replacing the semitic Arabic script between 200 B.C. and 200 A.D. Arab anthology credits King Vikram for this cultural change.[21]

Ishwar Datta Sharma refers to a poem in the Hindi Special Number of *Vikram*.[22] It was found by Jnanendu Deva Soofi and published by him in *Vishala Bharat*, Calcutta (1932). He discovered it in an ancient Arabic anthology edited in a MSS. which was copied under the orders from Sultan Saleem of Turkey under the title 'SIYAR-UL-OKUL', in 1742. The book is preserved in the library 'Makatab e-Jamahuria' in Istanbul and is divided in three sections : (1) Pre-Mohammad, (2) Mohammad to Bani Omaya, and (3) Bani Abbas to Haroon-Rashid. The poem reads as under :—

Ittrasshafaai Sanatul Bikarmatun faha lameen Kareemun yarti Fihaa vayovassasu, Bihillaahaa yasarmaamin elaa monkabbenarat Bihillaahaa yuhikaid howaa ya Fakharu,

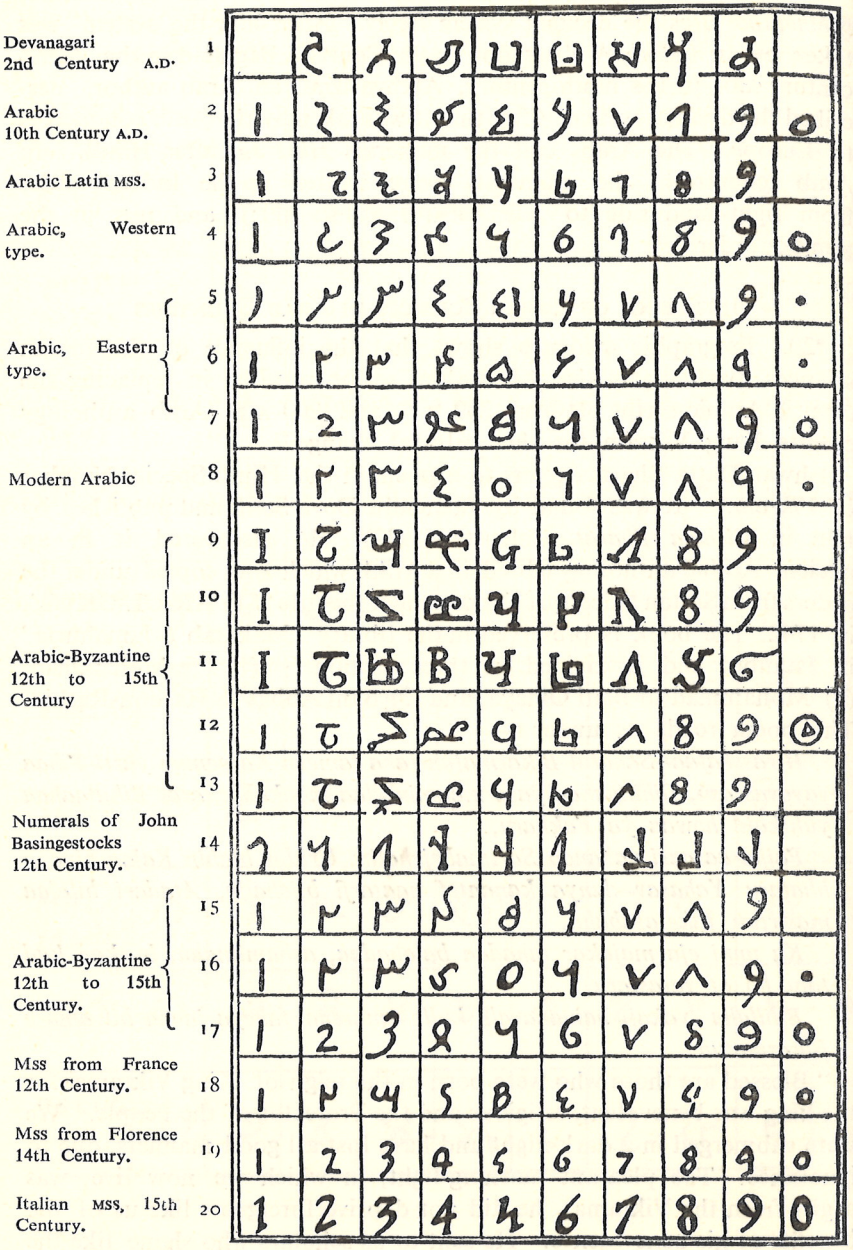
Fajjal-aasaari nahanoo Sarimabejehalin, Uridun biabin Kajan binaya hhataru Yahasav dunya kanaatef naatarfi bijehalin, Atadari bilalaa masirtun faketasabahu,

Ka unni eja majakar lahadaa balahadaa, ashamimaan, burkan kad tolu ho of vatastaru,

Bilillaha yakaji bainanavale kulle amarena, faheya jauna bil amare Bikarmatun.

"Blessed are those who were born in the reign of King Vikrama for the king was benevolent, religious and the Protector of the People. We were submerged in a dark night and have lost all good manners, due to ignorance. The pleasant morning-light, in which we now live, was a gift from the Vikrama; he did not deprive foreigners like us of the benefits of his benevolence. He sent to us scholars who shone like the

Table 28. **Development of Arabic Numerals.** *Courtesy : Alphalet*, Diringer, p. 571.


Devanagari 2nd Century A.D.
Arabic 10th Century A.D.
Arabic Latin MSS.
Arabic, Western type.
Arabic, Eastern type.
Modern Arabic
Arabic-Byzantine 12th to 15th Century
Numerals of John Basingestocks 12th Century.
Arabic-Byzantine 12th to 15th Century.
Mss from France 12th Century.
Mss from Florence 14th Century.
Italian MSS, 15th Century.

sun and these brought with them good pious laws, telling us the knowledge of the God, leading us through the right path. They came to our country, ordered by Vikrama, for spreading of Religion and Truth."

121. The Arabs learnt the numerals from the Hindus in the eighth century. Before that date they followed the A-b-j-d method based on the Hobrow Alphabet अ ब ज द etc. which they had learnt from the Greek and Roman methods.

International Forms of Indian Numerals

122. Indian numerals were introduced by the Arabs into Spain, from where during the twelfth and thirteenth centuries they spread over Europe, not, however, without considerable opposition. The bankers of Florence, for example, were forbidden (in 1299), to use them in their transactions, and the Statutes of the University of Padua ordain that the stationer should keep a list of the books for sale with the prices marked "*non per cifras, sed per literas claras*". The name 'ciphers' (Italian : *Zefiro* or *Zero* and French : *Chiffre*) used here to denote the new numerals, is an Arabic word, and indicates the immediate source from which they were obtained. Their use was at first confined to mathematical works. They were then employed for the paging of books, and it was not till the fifteenth century that their use became general. The earliest European forms are found in MSS. of the twelfth century and by the fourteenth century they had practically assumed their modern shapes. The twelfth century forms differ very slightly from the *Gobar* or 'dust' numerals, used by the Arabs in the tenth century, which are found in a MSS. of that date written at Shiraz, in Persia. According to the tradition of the Arabs they were brought from India about the eighth century. Comparing them with the contemporary Sanskrit and *Kawi* numerals this tradition is plainly seen to be correct.

123. "Europe is greatly indebted to India in the matter of sciences. The number-signs which are being used all over the world were discovered by the Hindus. It is impossible to estimate the influence of the decimal system of notation on the human civilization," observed Prof. A. A. Macdonell. The Roman system of number-signs—I, II, III, IV, V, VI, IX, X..L.M..C.., etc. is familiar. It is also used in the lower case form i, ii, iii, iv, v, vi, ... x.... l, m, c, etc. The usefulness of this system is limited as it makes use of a few letters and therefore counting could not conveniently go beyond thousand. Western philosophers were impressed by the use of ten-digit system of the Hindu mathematicians and they accepted the international form of Indian numerals.

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2. Bühler, Johann Georg, "Post Script on the Ancient Nagari Numerals," *Ibid*, p. 48.
3. Ojha, Pandit Gaurishankar, *Prachin Bharatiya Lipi-mala*, p. 114.
4. चतुष्टोमेन कृतेन अयानां। *Śatapatha Brāhamaṇa*, XIII, 3.2.1.
5. ये वै चत्वार: स्तोमा: कृतं जत। *Taitteriya Brāhamaṇa* 1.5; 11.1.
6. दक्षिणा गायत्री सम्पन्ना ब्राह्मणस्य ॥ (गायत्री = गाय त्र्यक्षर समान संख्या = चतुर्विंशति: = २४) जगत्याराज्ञ: ॥ जगती = जगत्याक्षर समान संख्या = अष्टा चत्वारिंशद् = ४८. *Kāttyāyana Śrautasūtra*, Weber, p. 1015.
7. रूपोनं षड्गुणोकृतम् ॥ (याजुष २३; आर्च ३१); द्विगुणं चायसंयुतं। (याजुष १३ आर्च ४); श्रविष्टाभ्यो गणाभ्यस्ताम् (आर्च. १९) युगलब्धं संपर्वस्यात् (याजुष २५) विभण्य भसमूहने (याजुष २०) *Vedānga Jyotiṣa*.
8. वर्गाक्षराणि वग वर्गे वर्गाक्षराणि भातूञ्चौय: ॥ अङ्गिनेवक स्वरा नवकेडिवन नवा त्यवग वा ॥ *Āryabhatīya*, *Arya* 1.
9. रूपात्कटपयपूर्वा वर्षा वर्ण क्रमादभवन्त्यङ्का:। ञनो शून्यं प्रथमार्थे ङ्ना छेदे पे तृतीयार्थे ॥ *Āryabhatīya-Āryasidhānta*, *Adhikār*, 1/2.
10. सप्तर्षीणां कणधञ्झञ्झिला। मुदयासिनधा। यनाख्यस्य ॥ *Āryabhatīya-Sidhānta* 2.9.
11. *Kāttyayāna, on Panini* I-3.11.
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